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**FORTNIGHTLY  
REVIEW**



## Subcontracts or Speed?

THE government is not finding it easy to spread subcontracting on defense orders to "small business." Fine as the idea sounded, it is still theoretical and largely impractical if speed on defense work is the primary consideration today.

It is not likely either that Congress will find a ready remedy for the serious economic dislocation among small firms whose peace-time productive pursuits have been materially curtailed, or eliminated, by defense priorities.

Certainly as far as aircraft production is concerned it can be taken as an axiom that the greater the spread of subcontracting, the greater the delays and hold-ups in production. Whatever major delays there have been during the past six months are invariably traceable to sub-contractors. The larger the number of sources of supply, the greater the chances of delay. The smallest part of an airplane is as important to the finished product as the largest and an airplane is composed of an extraordinary number of parts requiring precision manufacture.

The OPM Division of Contract Distribution, headed by financier Floyd Odlum, has three special trains now touring the nation to inform businessmen of the type of supplies needed for defense. Well-intentioned as this venture may be, it is scarcely the answer to a serious economic and production problem. It is

(Turn to page 22)

## Air Cargo Advocates Push Plans for Expanded Activity

**Proposed Freight Operation Would Slash  
Present Ton-Mile Rate by 75%;  
REA 'Monopoly' Attacked**

By ERIC BRAMLEY

ADVOCATES of extensive air cargo activity as a valuable aid to national defense refuse to be shouted down by those who claim such operations must wait until after the war.

The "must wait" school of thought took a back seat last fortnight as:

1. Seaboard Airways, seeking an airline route, revealed sensational plans for a cheap, high-speed air cargo service from New York to Miami and New Orleans.

2. Grover Loening, noted aviation consultant, urged the Civil Aeronautics Board "to encourage to the utmost" any new company proposing extensive air cargo operations.

3. Universal Air Freight Corp. applied to CAB for a freight certificate "between all states of the U. S.," for solicitation and ground handling of cargo.

4. NAA President Gill Robb Wilson, although mentioning shortage of equipment, emphasized that "air cargo is feasible today."

Indicative of the terms in which designers and manufacturers (Turn to page 42)

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## Vultee to Acquire Full Control of Consair Through Purchase of Maj. Fleet's Stock

**PURCHASE** of the controlling interest in Consolidated Aircraft Corp. by Vultee Aircraft, Inc., is expected shortly, following a joint announcement by the presidents of the two firms that initial steps of the transaction have been taken. Consolidated holds the largest backlog in the aircraft industry, while Vultee is an affiliate of the sprawling Aviation Corp.

The official statement was issued Nov. 25, less than 24 hours after first announcement of the pending

negotiations appeared in AMERICAN AVIATION DAILY. It was signed by Maj. Reuben H. Fleet, Consolidated president, and Richard W. Millar, of Vultee.

The negotiations, it was stated, are being carried on by Vultee and Maj. Fleet "as an individual," and not with Consolidated as a corporation. It also implied that Maj. Fleet's future status with the new owner of Consolidated would be in an advisory capacity.

Fleet, repeatedly an outspoken critic of the Roosevelt administration and of the "brass hats" in Washington, is one of the industry's

pioneer production experts. He is understood to be preparing to sell all of his 348,822 shares of Consair stock and other shares now in the Fleet family for a reported price of \$6,000,000.

Although Consolidated has 1,291,574 shares of common stock outstanding, this transaction would give Vultee full control of the larger company.

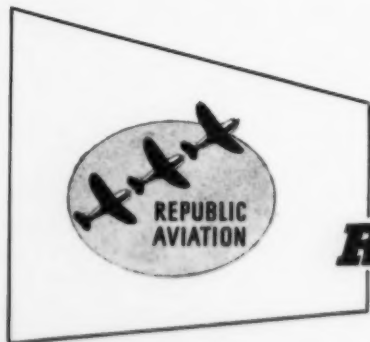
The preliminary discussions in the deal had been known for several weeks in industry circles, and earlier reports had Edsel Ford vying with Wall St. interests for the stock

(Turn to page 31)



"PEELING OFF" by John Hammer

**FIGHTING ACE FOR '42** . . . Republic Aviation, holding to the single objective of developing the ultimate in high-altitude interceptor aircraft for the Army Air Forces, records its newest and most noteworthy achievement—the *P-47 Thunderbolt*, a super-powered plane for a super-fighting job. Republic Aviation Corp., Farmingdale, N. Y.



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# British Fear Post-War Air Transport Obscurity

## Official England Ponders Civil Aviation Future As Pan American's Round-the-World Threat Becomes Stronger

By JAMES H. STRAUBEL

EMBATTLED Britain faces an "encirclement" for which it has no adequate defense—circling of the world by Pan American Airways.

The British aviation journal *Flight* threw all pretext aside recently in commenting:

*We believe, nay, we are certain, that we are already winning the War in the Air; but what about winning the Peace in the Air?*

But while War in the Air is loudly waged on widespread fronts, Peace in the Air is being quietly shaped by Pan American in deepest Africa.

It is a critical problem and Britain is hungry for an answer. And, although in the midst of war, the British are officially making plans for post-war commercial aviation.

The Pan American threat was expressed in the House of Commons not so long ago following a report on the agreement made between the British government and Pan American Airways Africa Ltd. for operation of an air transport service between West Africa and the Anglo-Egyptian Sudan. The speaker was O. E. Simmonds, M. P. As *The Aeroplane*, another British aeronautical journal, reports it:

"Mr. Simmonds reminded the Secretary of State (Sir Archibald Sinclair) of the policy of Pan-American Airways to run an airline right around the world and asked that reciprocity for the British airlines to fly over or call at United States territory should be remembered in any further negotiations with Pan American Airways or the U. S. Government. Asked to give assurance that the agreement would not be continued after the war, Sir Archibald replied that it would be premature to discuss any such matter."

More important, the British government has lately established a committee to investigate the post-war problems which confront British civil aviation. At the head of the committee, according to authoritative reports, stands Col. Sir Francis Sheldermine, recently retired at the age of 60 while Director-General of Civil Aviation in Great Britain.

The new committee faces "no small task," comments a British weekly published by the London Times, explaining "for since the start of the war British civil aviation has necessarily devoted all its efforts to the national cause. Meanwhile a number of neutral countries, notably the United States, have been able to give undivided attention to expansion and consolidation, and civil aviation in this country, therefore, will have a great deal of leeway to make up."

But the British, to state it in American terms, are "in the middle."

Pan American Airways is beginning its government-sponsored transport service, paralleling ferry flights, from the U. S. to Africa and across that continent to the Nile.

To achieve that route Pan American must link its African network to a far eastern "money run" which by land or sea has been the traditional British lifeline. Now, by air, it is the backbone of a hoped-for British service "drawing together our far-flung empire."

That service, proposes *Flight* magazine, would operate over a 12,823-mile air route joining the main constituents of the empire with high-speed service between London and Sydney, Australia, on the east, and Cape Town, South Africa, on the south, with principal intermediate stops at Alexandria, Egypt; Karachi and Bombay, India; Singapore; and Darwin, Australia; and Kisumu, Mombase and Durban, on the African east coast.

Over part or all of the vital run from Alexandria to Singapore several European airlines have oper-

aviation plans and acquire more and more fighters and bombers, Pan American adds transport ships and flying boats. British observers are aware that the greatest stumbling block to post-war empire service is equipment, and that adequate planes must come from abroad.

The official British civil aviation committee, states the London Times weekly, "will be faced with the problem of providing aircraft comparable to those on the airlines of other countries. The machines belonging to British Airways have throughout the war been undertaking arduous tasks which have meant much wear and tear. On top of that, the provision of many new aeroplanes has been out of the question, and if British Airways is to compete in the world market after the war on anything like equal terms with the airlines of other



PAA 'Plane of Tomorrow' Symbolizes Globe Circling

Shiploads of equipment are going over the South Atlantic for Pan American bases now being carved out by airline pioneers in the jungles.

During the past fortnight it has been revealed in Washington that official discussions are underway whereby Pan American would extend services from its Nile terminus—at or near Khartoum, Egypt—to a port on the Persian gulf. High government officials expect Pan American to push further east to Singapore—perhaps within a few months, surely within the year. With Pan American now serving Singapore from the east, this would complete the round-the-world circuit.

The Khartoum-Singapore run may be developed by men in khaki, for Pan American's African services are full fledged partners of the Army, and may be understudies of the military before the emergency is over. But Pan American's Juan Trippe, as did Columbus, eyes the shortest route to the east, and is expected to gain it.

ated (with British Overseas Airways and the Dutch KLM still offering spotty service). But all of the international airlines—BOA, KLM, Air France, and German services—familiar with far eastern transport, have either been seriously throttled or completely grounded by the war.

Pan American Airways, on the other hand, has found the war taking its ships for the first time into this eastern area.

What's more, the British need Pan American. Trans-African service—the airline's key peg for "encirclement"—comes as an answer to England's wartime ferrying and transport demands. But the British are worried over the post-war consequences.

"We have a war to win before we can think of civil aviation," commented British Air Commission spokesmen in Washington.

But aviation writers in London exclaim: "We need a bold plan for the future, an ambitious plan worthy of the greatness of the Empire."

And while the British talk of civil

countries, it is obvious that, at the start at any rate, it will be necessary for the Corporation to acquire suitable aircraft from abroad."

Writer John W. Morrison, in *Flight*, discussing the same problem, comments that immediately prior to the start of the war a number of "interesting British commercial aircraft" were in preparation, including the Fairey FC1 and the Short 14/38, trans-Atlantic planes with pressurized cabins.

"While it was inevitable that work on commercial aircraft be suspended," states Morrison, "it is hoped that these two firms are continuing research work on pressurized cabins."

Morrison and other British aviation experts are intensely interested in the Lockheed Constellation and in TWA President Jack Frye's comment that this new ship will insure the U. S. "virtual domination of the air from a commercial transport standpoint for several years to come."

And the report heard in Wash-  
(Turn to page 45)



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## Air Scoops

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### Pilot Training Funds

Big Bad Wolf of government agencies is the Bureau of the Budget. Playing Little Red Riding Hood just now is the Civilian Pilot Training Program, whose fate for fiscal 1943 is now being pondered by the Bureau. Civil Aeronautics Administration officials expect the '43 request for CPTP to be slashed when the Bureau submits its report to Congress late this month, but have hopes Congress will play the hero's role and boost it back up again.

Hearings have been held up on CPTP financing for '43, but the Bureau is careful about keeping the amounts sought secret until its Congressional report is made. Nevertheless, this is what is going on:

A boost of approximately one-third more money has been asked for CPTP in '43 above the \$25,000,000 granted in fiscal 1942. This would raise the total CPTP fund to about its fiscal 1941 level of \$36,814,504.

In detail: the Bureau has been asked approximately to double the ante in '43 on both the \$12,036,000 granted in 1942 for establishment of air navigation facilities and on the \$520,000 allowed for technical development, has requested virtual doubling of the \$2,740,000 available in '42 for enforcement of safety regulations, and a 20% gain in the \$15,500,000 on hand for maintenance of air navigation facilities.

As for the total CAA fiscal 1943 fund (of which CPTP is the second largest budget item): \$200,000,000-plus has been asked of the Bureau, compared to the \$157,500,000 allotted thus far in fiscal 1942. By far the biggest item will again be for airport development, which so far this fiscal year has totaled \$100,477,750. It is also the biggest variable on the CAA budget list, because of its dependence on defense requirements, but is expected to at least equal the 1942 amount.

### More Federal Control

A little wondering about what's happened to the government's proposal for certification of airports seems justified, but definite action on this somewhat tender subject is due by CAB any day now.

If the Board favors the certification idea (having already made certification of all pilots and aircraft mandatory), public hearings will be held, and the opposition, if any, will have its chance to

spout. Should the Board see it the other way, this recommendation for airports will be quietly forgotten. And if airport certification goes through, it will be effected under the Board's safety powers and plugged as necessary to control subversive activities through the regulation of all flight movements.

### Swan Songs

Remember the Tacoma bridge that suddenly fell apart, why no one seemed to know? Engineers who have studied the problem claim the bridge collapsed because suspension of cables of varying lengths, induced by steady wind, developed "dissonance of harmonic vibrations," which caused first the cables then the main structure itself to wave vertically until it broke up. Designer of the bridge adds that such vibration—which began as a ripple, ended as a tide—had been suspected but never before experienced in architecture.

A good amount of study still remains to be done on the subject, but several recent accidents to high speed aircraft equipped with twin tails have left several engineers wondering whether the same factors were not to blame.

These experts suspect that twin tails, at certain speeds, set up the same dissonance of harmonic vibrations which affected the bridge, causing stresses never before calculated at the factory, and resulting in loss of control and in some instances disintegration of the twin empennages.

### Director as Usual

Artemus Gates promptly resigned from the board of Pan American Airways when appointed Assistant Secretary of the Navy for Air, but Eddie McDonnell is still a "regular" at PAA directors' meetings, drawing a neat fee as directors usually do, despite a call to active duty with the Navy months ago.

McDonnell is in command of the Naval Air Station at Floyd Bennett Field, close to Manhattan, where those PAA directors gather. Adm. Towers, Chief of the Navy Bureau of Aeronautics, has apparently raised no objection to McDonnell's continued participation in private aviation affairs, but some officials in high administration circles have raised their eyebrows over the propriety of government representation on the board of a company so closely tied up in business with the U. S. Other PAA directors maintain a polite but uncomfortable silence.

### Wingless Optimism

Many wise old industry heads are skeptical of the post-war lightplane "boom" so often described with adjectives aplenty, save their optimism for thoughts on the future of helicopters.

Igor Sikorsky's tricks with wingless craft have prompted a prediction "boom" on what his now queer-looking Buzzard might do for aviation, have led to visions of "backyard airports" and the like.

But it gets down to bed rock when reports state that among the "big boys" giving attention to the helicopter in future planning are United Aircraft, Curtiss-Wright and Ford.

### Any Answers?

Question: Why within recent weeks has the order come through officially prohibiting Canadian defense officials on duty in this country from traveling by air except under "extreme necessity"?

### Not For Sale

Talk of a financial change in Western Air Lines is said to be just talk and that's all by men who should know. It seems that William A. Coulter owns 50% of Western's stock and isn't selling despite a dozen or so nice offers during the past year. The same "no sale" sign is reportedly hung out for Continental Air Lines, which is closely controlled by four men who are not in the selling mood. In fact, best bet for a financial shift among western air transport firms is still Inland, and this is nothing new. It is fairly well known that if and when Dick Leferink and a group of prospective buyers ever get together on a price, Inland will change hands, although even this may not occur in the near future.

### Reverse English

One industry group which isn't supposed to be offering much opposition to the "profit limiting" plans underway in Washington is the large, established aircraft parts and accessory manufacturers. Why? They claim that if the prospect of sizable profits did not attract so many new, small units into their field, they could achieve faster, cheaper production. Also, they are said to worry about competition being artificially attracted into their peace-time field, and would welcome seven or eight per cent profits on volume business with a healthy chance to survive after the expected post-war letdown.



**"MEET ME AT MIAMI"** might well be the rallying cry among bird-men and other aviation enthusiasts for the 14th Annual All-American Air Maneuvers at Miami, Florida, January 9-11. Everybody goes, everybody thrills.

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# Airlines Allotted 112 Transports for 1942

THE AIRLINES have been allotted 112 planes for the calendar year 1942, including 84 Douglas DC-3s and 28 Lockheed Lodestars, of the total of 228 recently released by the Supply Priorities and Allocations Board. The balance are reserved for the first six months of 1943 and for emergency requirements of a defense nature not now foreseen.

In making the allocations to the individual airlines, the Civil Aircraft Committee was so meticulous to clear all possible legal questions that formal announcement of the division of equipment did not come until ten days after the committee's action and airlines were not given formal official notification of their share for another four days. This interim was absorbed by the Civil Aircraft Committee in marking time, waiting for an order in black and white from Donald Nelson specifically authorizing OPM Aircraft Branch Chief Merrill Meigs to perform the allocation duty in his name.

Several minor changes in the first draft of the allocations were made by the committee, including the diversion of three DC-3s from Pan American Airways to other lines. This move was made on the understanding that the production schedule for 4-engined commercial DC-4s would be advanced forward from earlier estimates as Douglas is planning to step up deliveries by a slight increase in plant facilities.

## Cost of Vinson Quiz Soars to \$116,000

CONGRESSIONAL hearings by the Vinson committee to stimulate enactment of legislation limiting defense profits to 7% will be postponed from December 1 until after the Christmas holidays. Mr. Vinson wants to start off with a whim and prefers to wait until after New Year's so that he can get full attendance and full attention for his show.

Last week he appealed to the House for a second \$25,000 to continue investigating aircraft and shipping industries and, in so doing, warned that he expects to keep wearing his Sherlock Holmes suit until the war is over. A few voices were raised on the House floor against his investigation on the grounds that "it is perfectly ridiculous to entrust the spending of these billions to administrations who must be followed-up by plainclothesmen." But the House approved the \$25,000 just the same . . . even after Vinson admitted

that he has also spent—already—another \$66,000 by borrowing personnel from the Navy and other government agencies. That makes a total of \$116,000—so far.

Mr. Vinson let it be known that inspection of two aircraft manufacturing companies—Glenn L. Martin and Consolidated Aircraft Corp.—would indicate that the aircraft industry is making an average profit of only 4.8%. Shipbuilders are making 6.8%, he claims, both thus coming well under his proposed profit ceiling. But there is some suspicion in business circles that the same accounting procedures might not be applied if a profit limitation measure were enacted, that the Congressman in fact may be attempting by his announcement of these figures to quiet the growing opposition of private industry to a profit ceiling law, that he may later say that investigation of more than 2 aviation companies shows a different picture.—C. W. P.

## 1942 Allocation of Transports to Airlines

### Lockheed Lodestars

	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
Continental .....	2	..	..	..	..	2
Mid-Continent .....	2	..	1	2	2	7
National .....	2	..	..	2	2	6
Trans-Canada .....	4	2	..	..	..	6
Pennsylvania-Central .....	4	..	3	..	..	7
Totals .....	12	4	4	4	4	28

### Douglas DC-3s

	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Totals
American .....	..	3	3	6	..	5	1	18
Braniff .....	..	..	..	3	..	..	..	3
Chicago & Southern .....	..	..	..	..	2	..	..	2
Delta .....	..	..	..	..	..	3	..	3
Eastern .....	..	..	..	..	6	..	5	11
Northeast .....	1	..	..	..	..	..	..	1
Northwest .....	..	4	..	..	..	..	..	4
Pan American .....	5	..	..	..	1	4	6	16
TWA .....	..	5	..	3	3	..	..	11
United .....	6	..	8	..	..	..	..	14
Western Air .....	..	..	1	..	..	..	..	1
Totals .....	12	12	12	12	12	12	12	84

## Permanent House Subcommittee Created To Handle All Non-Military Aviation Bills

By CELESTE W. PAGE

CIVIL AVIATION won new recognition from Congress last week when a permanent House subcommittee was appointed to keep current and informed on all non-military aviation legislation. This move was hailed as an important step forward by aviation leaders, both in and outside Congress, who have lamented the lack of expert handling of aeronautical legislative problems and who interpret this development as indicative of an awakening by Capitol Hill to the growing importance of aviation's place in the economy of the country.

Washington aviation people long have complained that Congress has failed to keep pace with the rapid strides of air transportation and has often slowed the pace of airline development by inadequate or misdirected legislation, enacted more through ignorance of aviation on the part of members of Congress than through intent to regulate. But in the past year, largely because of the efforts of a handful of aviation enthusiasts in the House, a majority of members have come to realize the vital role of the airlines in modern life. The extent of misinformation on the subject has been almost beyond the understanding of those close to the picture.

The new subcommittee is assigned to the exclusive task of keeping abreast of civil aeronautical problems. That it intends to do so appears evident from the first day's existence of the group when it was announced that hearings

would be held at once on a major piece of pending legislation—the Randolph bill to broaden the civil pilot training act to authorize CAA to train aircraft mechanics as well as pilots.

Created within the House Interstate and Foreign Commerce Committee, the 7-man subcommittee is headed by Rep. Alfred L. Bulwinkle (D., N. C.) as predicted in the last issue of AMERICAN AVIATION. Other members include Democratic Reps. Clarence Lea, of California, chairman of the full committee; William P. Cole, Jr., of New York, and Lyle H. Boren, of Oklahoma; and Republican Reps. Charles A. Wolverton, of New Jersey; James W. Wadsworth, of New York, and Charles A. Halleck, of Indiana.

### Nichols Plan May Be Doomed

Advocates of a separate aviation committee, independent of the Interstate and Foreign Commerce Committee, expressed the hope that the Bulwinkle group would constitute "a step forward in recognition of aviation by the House" and lend stimulus to interest for an independent committee, rather than short-circuit their efforts along these lines. Other sources on Capitol Hill, however, took the view that the chances of an independent civil aviation committee are doomed for the present at least by appointment of the subcommittee.

Hearings are scheduled to open December 8 on the Randolph aircraft mechanics bill which is now favorably recommended by CAA. At first CAA shied away from the

proposal to avoid an unpleasant argument with the Office of Education, which already conducts an aircraft mechanics training program. The OE program, however, is limited to public schools and institutions by the law under which this agency operates, thus barring the use of the facilities of private training schools in building up a healthy backlog of mechanics for the expanded military air defense program. CAA has adopted an attitude of willingness to undertake the training of mechanics if authorized by Congress.

Should the Randolph bill pass, it is expected that CAA would conduct the program in the same way as the CPTP, by letting contracts to private training schools.

### Other Bills on Docket

Several other measures of importance are waiting for action by the new subcommittee. Among these are three bills sponsored by Rep. Jack Nichols (D., Okla.), developing out of his investigation of airline accidents which, incidentally, is still in progress.

One of these (HR 5117) would regulate the lighting of airports while the other two concern aviation training—training by CAA of traffic control tower operators (HR 5119) and advanced training of technical CAA personnel (HR 5116).

The question of the desirability of a civilian glider pilot training program is also expected to be tackled by the Bulwinkle subcommittee.

(Turn to page 14)



Douglas A-20 Light Attack Bomber

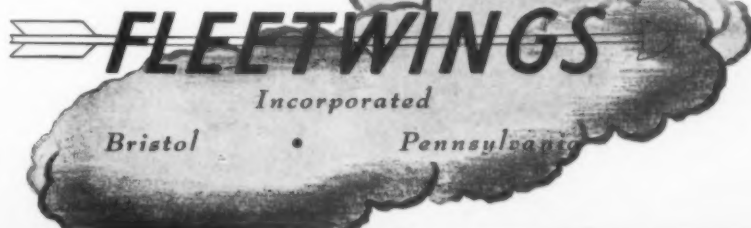
Vought "Corsair" F4U-1 Fighter  
used by the Navy

## Leaders Look to FLEETWINGS for Parts

Republic P-47 "Thunderbolt"  
Army Fighter

Brewster, Douglas, Republic, Vega, Vought-Sikorsky, Vultee . . . names that are sky-writing history . . . are among the many who look to Fleetwings for control-surfaces of aluminum alloy or stainless steel and other parts. ★ "Fleetwings" is a descriptive as well as a firm-name when it comes to putting speed into the making of fins, stabilizers, elevators, flaps, rudders, ailerons, spoilers and other parts. ★ If you are in need of a dependable sub-contractor—one who can meet your production schedules—look to Fleetwings!

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## Building An Air Cargo Fleet

# Navy Orders Three Sikorsky Flying Boats

**T**HE Navy's recent order for three long-range Sikorsky flying boats, announced during the past fortnight, and revelation that additional orders are in prospect, indicate further that the Navy is planning to build up a large air cargo fleet and "adopt" American Export Airlines to help operate it.

Meanwhile, at Vought-Sikorsky's Stratford, Conn., plant, final touches are being put on the three new flying boats for Export, first of which is expected to be launched about Dec. 15. All tests may be completed by Jan. 1, and the other two Export planes are due for delivery early next year.

Details on the new Export flying boats, released for publication during a press inspection of the plant Nov. 12, give emphasis to the question of whether landplanes or flying boats are destined to be the most efficient aircraft for long distance trans-oceanic travel—a question which may take its place along with the air cooled-liquid cooled engine controversy.

But the major development is the Navy's new interest—prompted by wartime demands—in long range transport-type flying boats.

If the Navy-Export plan, revealed by AMERICAN AVIATION Nov. 15, is carried through in its present form, the Navy is expected to take over the Export flying boats as first members of the contemplated fleet.

### Cargo Planes

The Navy, it is understood, has ordered the three new planes from Sikorsky as cargo ships for the fast over-ocean transport service which the war has made almost mandatory. Washington sources reveal that the Navy contemplates additional purchasing of the same type of craft.

The flying boats on order are to resemble closely those now being completed for Export. Expected changes are armor, armament and an interior designed for cargo rather than passenger carrying. Designed after the Navy's experimental XPBS, the new planes will be known as the VS-44-A type.

Although the new Export planes are designed for luxury trans-oceanic travel, it will take only minor changes to convert the flying boats into Naval cargo carriers, and the tail of the craft has a place for gun turrets.

"The flying boat is and will remain the most efficient plane for long distance trans-oceanic travel," stated Igor Sikorsky, designer of the new planes, in a talk to newspapermen Nov. 12.

The landplane, he said, is ideal for short range flying over land, but only the flying boat offers the long range necessary for over-water

flying, adding that flying boat advantages gain as the size of the craft increases.

"Any comparison between the landplane and flying boat is worthless unless it is on an identical range," said Sikorsky, "and if this comparison is made, the only answer is the flying boat."

### Interest in Landplanes

Ordering by Pan American Airways, only real trans-oceanic air-line this country can boast, of 40 new Lockheed Constellations has within the last few months stimulated interest in landplanes for ocean travel. Ferrying of large landplane bombers since the start of the war has greatly increased the available information on over water landplane flying. "Future developments," comments an authoritative British source, "seem likely to favor landplanes for long-range work."

Lockheed's Constellation, for which mass orders have been held up by OPM, is reported by the makers to be capable of at least a 4,000 mile range, 293 mph cruising speed, and maximum capacity of 64 passengers including a crew of seven.

Igor Sikorsky's new flying boat, which will be in the air long before the Constellation, is reported by the company to be capable of at least a 6,000 mile non-stop range under special fuel and load conditions, cruising speed of 175 mph with full load in long-distance flights, and maximum capacity of 40 passengers, including a crew of 11.

Sikorsky has stated "I believe there is no other plane capable of that performance." Available records indicate that he is right. And whether new landplanes now projected will be able to exceed it, is problematical, but two schools of thought have developed on the subject of landplanes and flying boats.

The company claims the new flying boats will be able to fly 1,000 pounds payload from New York to any point in Europe or the Persian sea, or to Vladivostok, Siberia, from New York, all non-stop, and to possess a range exceeding one-fourth the distance around the world at the equator.

### 12 Compartments

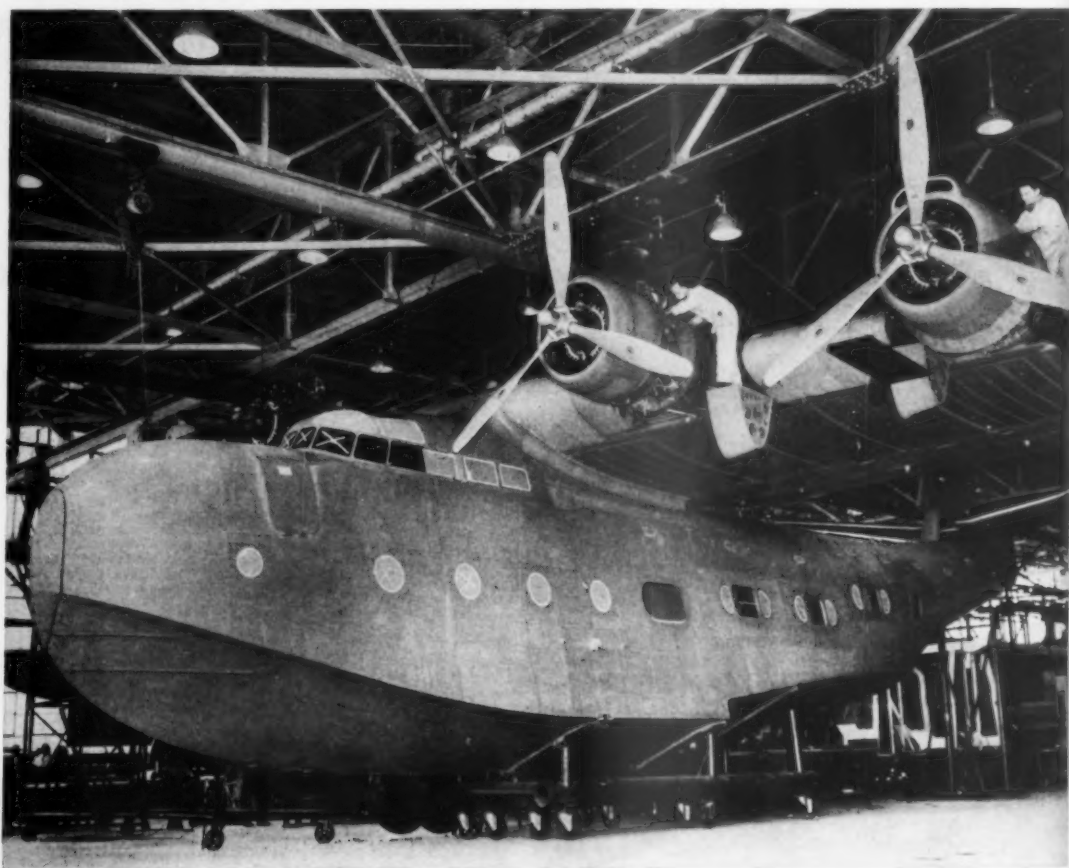
Hull of the ships is 80 feet long, and is divided into 12 compartments in addition to the flight

bridge located on an upper deck. The large cantilever wing spans 120 feet. Tail surface area is greater "than the entire surface area of an average military pursuit ship." The plane is powered by four Pratt & Whitney 14 cylinder engines of 1800 hp each, equipped with full-feathering three-bladed Hamilton Standard propellers.

Mass production methods are reportedly not used in the construction. The company reports that 40 working days and 110,000 man hours are required to build one hull (200,000 rivets are used in the hull 500,000 in the entire plane—Ed.) It can be expected that with the new Navy orders, the production rate will be stepped up.

The hull, of aluminum alloy construction with six water-tight bulkheads, is so designed that any two compartments can be flooded and the ship still remain afloat. The hull has six openings beside its main entrance door—mooring hatch in the bow, bow cargo hatch, two pilot hatches, wing hatch just aft of the rear spar, and a stern cargo

(Turn to page 13)



First of a Fleet for American Export Airlines  
Two Sister Ships Are Being Completed by Vought-Sikorsky



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# America . . . BIRTHPLACE of ORIGINAL DESIGN

The creative genius of the aircraft industry is strikingly revealed in production activities at Vought-Sikorsky. Four distinct types of aircraft are now being built:

- ★ The Navy's standard observation scout
- ★ The first successful American helicopter
- ★ A Navy fighter hailed as America's fastest
- ★ The first non-stop trans-Atlantic transport

And on the drafting boards even more revolutionary types are being created.



**VOUGHT • SIKORSKY**  
**AIRCRAFT**

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OF UNITED AIRCRAFT CORPORATION



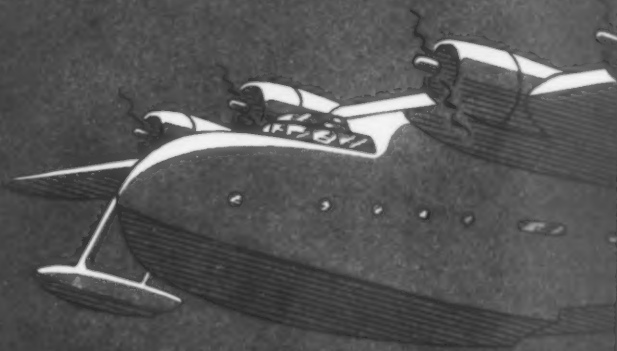
OS2U-3—OBSERVATION SCOUT  
"KINGFISHER"



VS-300A—AMERICA'S FIRST SUCCESSFUL  
HELICOPTER



F4U-1—SHIPBOARD FIGHTER  
"CORSAIR"



VS-44A—OVER OCEAN TRANSPORT

## With Only 48 Blimps Authorized . . .

# Development of Airships Now 'Mandatory'

**Capt. Rosendahl, No. 1 Authority, Would Speed Up Efforts to Fight Subs and Mines, Advance Agents of War**

**I**N THE first World War, the British found need for 190 blimps, or one for each 22 miles of coastline, and the French one for each 49 miles; and "if we stick to only our authorized 48 blimps, we must be expecting each to cover more than 100 miles—truly a compliment for the modern airships."

Thus speaks the U. S. Navy's Number One airship authority, Capt. C. E. Rosendahl, who believes that as soon as modern blimps begin entering the field and show their usefulness, we shall want many more.

These statements followed closely delivery to the Navy by Goodyear Aircraft Corp. of two "K" ships under a recent order. An additional order for 21 more patrol airships of the "K" type was signed last month; Goodyear has four more under construction on the previous contract, and delivered two smaller "L" type training ships earlier in the year.

Total contract for the 29 ships is around \$8,000,000. Congress has authorized a total of 48 airships.

Although the U. S. now operates only non-rigid airships of the "L" and "K" types—no rigid types similar to the now scrapped *Los Angeles*—the latest Naval Policy reads as follows with regard to lighter-than-air craft:

- To build and maintain non-rigid airships for coastal patrol and for other naval uses.
- To build and maintain rigid airships as necessary to explore and develop their usefulness for naval purposes, and to cooperate with other agencies in developing commercial airships.

Almost forgotten is authorization, given by Congress in the 1938 Naval Expansion (Vinson) Act, for a 3,000,000 cubic foot rigid training airship with dimensions somewhat larger than the old *Los Angeles*.

Public attention in the large rigid types—composed of a complete metallic structure with a cotton fabric outer cover—has never re-awakened since the series of disasters among huge U. S. and German airships. Attention on the part of governmental leaders has been overshadowed by the naval aircraft expansion program.

Modest as it is, airship interest in Washington today centers on the non-rigid blimps of the "L" and "K" types. These craft are formed by a rubber or fabric gas container, with no internal structure, the shape be-

ing maintained by the proper ratio of gas and air pressure.

The smaller, or "L" type, has a 123,000 cubic foot volume, is 150 feet in length, and is used for training a one- or two-man crew. The 250-foot "K" type is much larger, containing 416,000 cubic feet, and serves as a patrol ship.

The Navy now has 10 airships in commission at Naval Air Station, Lakehurst, N. J., four of them being of the training type.

Three new airship bases are being constructed, at South Weymouth, Mass., Elizabeth City, N. C., and Sunnyvale, Cal. Training classes are being conducted at Lakehurst for naval officers and cadets to man the new ships, and the Goodyear company will shortly graduate a class of 18 pilots, who will be eligible to apply for commissions in the Navy, or may be used as replacements for the seven Goodyear pilots already on active duty at the New Jersey Navy base.

### Used in First World War

Blimps were used extensively in the first World War in convoying troops, ships and supply ships across the English Channel, and were regarded as highly useful weapons against submarines and for the location of mines.

Capt. Rosendahl is of the belief that the configurations of fate have bestowed the modern blimp almost exclusively upon the U. S. "Our own geographical situation, our unbounded monopoly of non-inflammable helium gas make the airship exclusively an American weapon," he asserts. "Situations that would confront the U. S. in war make development and use of airships mandatory for us."

In reviewing how the airship



**Nose Battens**  
*Rigidity in the Non-Rigid K-4*



**'Exclusively an American Weapon'**  
*Europe is Today Deprived of the Use of Blimps*

patrol helped kill the sub menace for Britain in 1918, Capt. Rosendahl points to the blimp as having become the dread of submarine captains. But mainly because of the relatively short distances, the small sea areas and tremendous numbers of airplanes being employed, Europe is today deprived of the use of blimps.

### Slowness Called Advantage

"Today when air speeds are measured in hundreds of miles per hour, strangely enough the small airship's very slowness is a peculiar advantage . . . To investigate spots on the surface a plane cannot slow down and hover but must circle at high speed—a tiring and not particularly efficient job. The blimp simply pauses and hovers above

"There were several cases where the ability of blimps to hover over suspected areas for five to 10 hours brought opportunities to attack enemy subs.

"In one instance, a patrolling airship came upon a vessel but recently torpedoed. For six hours, the blimp searched the area without results; then suddenly a submarine broke the surface a few miles away. Hurrying to the attack, the blimp dropped bombs on the sub, which tried to submerge, but the airship's patience quickly brought reward in a successful attack . . .

"Not all the airship success was on the part of the British. A Zepelin sighted and bombed the British submarine E-18 which was lying in 70 feet of water . . .

"It is a matter of historical fact that not a single Allied convoy protected by airships was ever successfully attacked by submarines," Capt. Rosendahl points out.

The feeling abroad seems to be that over the relatively small sea areas in the heart of the present

war in Europe, the air is generally so full of enemy planes that an airship operating there, even if filled with helium, could quickly be riddled with enough bullet holes to force it down.

Yet it is believed that with adequate daytime protection by fighting planes the blimp might render commensurate returns to the side having air superiority. Similar protection in combat zones is furnished to minesweepers, other utility craft, and even to battleships.

"In American employment of blimps," Capt. Rosendahl believes, "the situation is quite different. An airship can't be mined or torpedoed, and certainly it will not stupidly get within range of enemy guns at sea or on land; actually the concerns of the airship boil down solely to airplane attack.

### Patrol Area Defined

"Our blimps are not going to be sent out hundreds or thousands of miles to sea where planes from enemy ships or bases might find them. Our blimps have an abundance of work on 'inshore patrol' in our densely packed coastal sea lanes; if enemy or ships ever get in that far, it will be only after some inexplicable failure of our deep sea surface vessels and airplanes."

The crew members of the patrol airship (type "K") can move about freely and converse easily with one another. Cooking, washing, toilet facilities, radio, and a photographic room are available. Armament of machine guns or light cannon, bombs or depth charges are carried. Absence of wings, and the suspended position of the car provide all-around vision and give every crew member clean view of everything within range of the eye and optical aids. Generally, a few hundred feet altitude suffices, but the

(Turn to page 25)

# Mustangs



## Range the Frontiers of Freedom

Just as the frontiers of America grew beneath the flying hooves of the mustangs, so today's frontiers of freedom are guarded by North American Mustangs—swift pursuits named for the hardy strain of American wild ponies.

These fleet, agile fighters, in active service with the RAF, are helping Britain attain complete supremacy in the air.

CURTISS-WRIGHT CORPORATION • *Propeller Division* • CALDWELL, NEW JERSEY  
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CURTISS *Electric*  
PROPELLERS



*Air Power*  
is  
*Sea Power*

**CONSOLIDATED**  
*Aircraft* CORPORATION  
ESTABLISHED 1923  
SAN DIEGO, CALIFORNIA

LET'S GO! U.S.A.  
KEEP 'EM FLYING!

In flight, the U S. Navy's Consolidated PB2Y. At the take-off, a Navy Consolidated PB4Y. Export versions of the PB4Y are also in service for the British, Canadian, Australian and Dutch East Indies Governments.

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# U. S. Exports in '41 to Pass Output of '40

## Aid to Russia Program Spurs Shipments Abroad

By CHARLES ADAMS

**U.** S. AIRCRAFT exports to the Allies, recently spurred by the program of all-out aid to Russia, now appear certain to total over \$700,000,000 in 1941, more than this nation's entire production last year.

While data on exports have recently become even more closely guarded than figures on output, latest reports are that:

● Over 40% of this nation's estimated \$1,750,000,000 aeronautical production in 1941 will be exported.

● Slightly over 30% of the estimated 20,000 military planes to be produced by the U. S. this year will be sent abroad.

● The acceptance of Russia as a full-fledged partner in the war against "aggressor nations" has spurred efforts to get U. S. combat planes into action against Germany NOW.

● Deliveries of aircraft under Lend-Lease during the first six months of the law were insignificant, with most exports to the British still being made under contracts signed prior to March, 1941.

● Whether our aid to Britain has enabled the RAF to overtake the Luftwaffe in strength is unknown, but expert speculation is plentiful.

Briefly, the status of our contribution to the Allies' aeronautical strength is as follows:

During 1940, the U. S. exported 3,532 aircraft, over 75% military (trainer and combat), of which Great Britain received 1,376, France 750, Canada 539 and China 110. Total value of exports was \$311,757,326, including \$170,000,000 for planes, mostly powered, \$50,000,000 for engines and the remainder for propellers, parts and accessories.

### 3,639 Planes Shipped

During the first eight months of this year, the U. S. shipped 3,639 airplanes abroad, around 75% of which were combat. Total value of all aeronautical exports during this period was \$379,071,608, (well in excess of the figure for all 1940), of which approximately \$330,000,000, or 87%, went to various parts of the British empire, and a large share of the remainder to China and the Dutch East Indies.

It is estimated that around 3,000 planes went to the British empire alone during the first eight months of 1941, about three-fourths, or 2,250, being combat types. If the same proportion of U. S. production is shipped abroad in the last four months of the year as in the first eight—and indications are that the ratio will increase—this nation's dollar volume exports in 1941 will total well over \$700,000,000 and planes will number at least 6,500.

Around 5,000 planes will go to the British, approximately 3,800 of them combat. This figure of 3,800, then, represents fighting craft from four-motored bombers to pursuits made available by the United States in 1941 to Great Britain to wage aerial warfare with Germany or to defend its empire outposts from Cape Town to Singapore.

### Still in Early Phase

Production of planes for Britain is still largely in its early phase, with the vast majority of U. S. manufacturers rushing work on contracts awarded prior to the inception of the Lend-Lease law.

Thus, while output of airplanes, engines, propellers and other equipment for the British was totaling around \$40,000,000 monthly by late summer, the Lend-Lease phase was just getting under way.

Statistics show that:

1. Original British orders placed with American aircraft manufacturers prior to Lend-Lease inception totaled around \$2,000,000,000.

2. Total aeronautical deliveries to the British from Jan. 1 to Sept. 1 were \$330,000,000.

3. During the first six months' operation of Lend-Lease—March 1 to Sept. 1—approximately \$1,300,000,000 worth of aircraft and equipment was contracted for under Lend-Lease authority.

4. Total aeronautical exports to the British under Lend-Lease authority (Mar. 1 to Sept. 1) amounted to \$6,016,045.

Thus total 1941 deliveries to the British to Sept. 1 were 50 times greater than Lend-Lease deliveries. A survey taken by the Aeronautical Chamber of Commerce among nine leading aircraft companies who jointly represented more than 60% of the industry's backlog disclosed that from 80% to 100% of their 1941 British deliveries are under contracts preceding Lend-Lease.

### Aid to Russia

Meanwhile, part of the aid that was originally destined for Great Britain is being diverted to Russia. For the first several months of the Russo-German war, the administration was reluctant to give all-out aid to the Soviet, fearing a quick Nazi victory on the Eastern front. Now, however, with reports from the American mission to Moscow that the USSR is capable of prolonged resistance, shipments of aircraft to that country have accelerated sharply.

Even though the present rate of our exports to the Allies bulks small if compared to the potential aid from this nation when capacity production of aircraft is reached in 1943, Winston Churchill has declared that the RAF's strength is already on a par with that of the Luftwaffe, an opinion which has confounded observers on both sides of the Atlantic. Most British commentators take the Prime Minister's statement at face value, but point out that mere air parity with Germany would be far from sufficient to guarantee either the security of

Britain's possessions or assumption of the offensive.

Meanwhile, T. P. Wright, assistant chief of OPM's aircraft branch, estimates that total air power of the Allies will be greater than that of the Axis early next year. He predicts U. S. production of 2,400 planes a month at the end of this year, British output of 1,900 and German 2,300. That Wright's prediction of U. S. output by the end of the year is accurate is conceded. In fact, Washington observers believe U. S. production will climb from 2,275 in October to 2,500 in November and

2,700 in December, barring strikes.

But estimates of Britain's and Germany's production vary as widely as figures on their total air strength.

Glenn L. Martin recently was quoted as saying that Britain and the U. S. will overtake Germany's output by next July or August. That's a far cry from Wright's figures showing U. S. production alone exceeding Germany's by the end of the year. And Martin, incidentally, predicted that it will take two more years to defeat Germany.

## Navy Orders Sikorskys

(Continued from page 8)

hatch at the extreme rear end of the hull.

### 4,000 Gallon Capacity

The wing, with a center section and two outer panels, has three separate built-in tanks in its center section with capacity of 4,000 gallons of gasoline. Between the center tanks and outboard tanks, space is provided for baggage, mail or additional fuel tanks. De-icer tubes cover the leading edges of the wing, fin and stabilizer.

A fire-control system of novel type is installed for the four engines, with a system of warning lights to inform the flight engineer of the location of the fire, thus enabling him to direct the extinguishing carbon dioxide to the spot through 22 outlets in each engine nacelle.

American Export Airlines engineers designed the radio apparatus, which includes code and radio telephone and an emergency code set. In addition, there is a complete inter-communicating system.

The company also reports:

"Luxurious passenger accommodations reflect many refinements in design. More space is available per passenger than in any other commercial aircraft. As these are the longest-range, non-stop commercial airplanes to be built, special provision has been made to assure utmost comfort for passengers in flight.

"Each plane can be outfitted to accommodate 40 passengers for day-time flying. For non-stop trans-Atlantic service they are equipped with full-size sleeping accommodations for 16 passengers.



Typical Compartment in New Flying Boats



# California Tax Tangle Puzzles Manufacturers

## 3% Sales Levy Threat to British Purchases is Center of Confusion

By JAMES L. STRAIGHT  
West Coast Editor

California's aircraft manufacturers and the governments of the U. S. and Britain are caught in the middle of one of the most confusing tangles of the defense program. The puzzle, involving millions of dollars in taxes, was brought out into the open during the past fortnight by official developments in Washington.

Responsible for all the "mischief" is the state of California's 3% sales levy.

The Washington developments:

1. Revelation that the U. S. and Great Britain on Oct. 17, 1941, signed a treaty exempting all "cost-plus" contracts of the British government in this country from taxation.

2. Upholding by the Supreme Court of the right of a State to tax private contractors working for the Federal government on a "cost-plus" basis.

The treaty, at this writing, is up before the Senate Foreign Relations Committee for ratification. Although some opposition has developed at hearings held on the issue, it is expected that the treaty will be ratified eventually. Both the President and Secretary Hull have urged ratification.

The Supreme Court ruling reversed a decision by the Alabama Supreme Court, and specifically stated that sales and use taxes imposed by Alabama on construction materials purchased by contractors who later were to be reimbursed by the Federal Government should be subject to state taxation.

### 21 States

Twenty-one states have sales and use taxes of various kinds, and of course each one is directly involved, but nowhere did the Wash-

ington developments mean so much as in aviation-minded California.

For the last several months the gigantic aircraft industry of this state (three billion dollars backlog) has been the center of a tax squabble involving legal points drawn as fine as legal points come, and over which company counsels have pondered aplenty.

The result of it all will still be up in the air, despite settlements in Washington. British officials feel ratification of the tax treaty "should take care of the situation," but California observers are not so sure. The state sales tax, for instance, is retroactive, and even though the treaty is effective Oct. 17, as assumed, there is ample opportunity for fireworks.

### May Have to Pay

In fact, during an early 1941 special session of the California legislature, various Federal agencies were conspicuously represented in negotiations to write into the state tax law a specific exemption of aircraft purchases by the federal government. But perhaps they didn't go far enough, for the tax still applies to the purchases of all aircraft component materials by the prime manufacturers and sub-contractors. That is thought to be the effect of the Supreme Court decision on the Alabama issue.

The result may be that aircraft manufacturers in the state must retroactively and henceforth be held for a 3% tax on all materials, parts and accessories bought within the state for the building of aircraft, whether the planes are built for private, federal or foreign purchasers. It isn't as bad as it sounds, however, for such costs are easily recognized by the government in cost-plus contracts with aircraft builders, so from the looks of things it is basically a problem for the federal government to face.

It seems that even the taxation of direct British aircraft purchases would end up with our own government in the middle, due to the manner in which the U. S. is financing the war effort.

However, such taxation would surely set a precedent which would be felt by the manufacturers in the future. It might well jeopardize California's hold on aircraft production in this country, in forcing higher costs for planes through taxation in the post-war market and thus hurt sales.

At any rate, the tax is levied directly on the manufacturer under state law. But British officials reveal they have promised manufacturers that should the sales tax apply they would assume it. Such stipulations are said to be in each contract. In such a case it is assumed that the British would look for help from Uncle Sam.

### Even Direct Purchases

There is a fair possibility that direct British purchases coming before the proposed treaty is effective might be taxed by California. To this prospect the British say they would probably claim "diplomatic

immunity." But a California Supreme Court decision holds that any form of retroactive tax exemption is no different than a "gift" out of the state treasury, and the state constitution specifically forbids lawmakers from making gifts. So this side of the problem is far from settled.

Although kept quiet, the whole issue passed a milestone Oct. 15, deadline for filing of gross sales returns with the State Board of Equalization, covering airplane deliveries since July, August and September. Just before that deadline, Dixwell L. Pierce, secretary of the California Board of Equalization, was of the opinion that:

"We must continue applying to the transactions of the British the same tests of taxability that we would apply to similar transactions by private parties. We have taxed or held exempt their various transactions in accordance with an opinion of the Attorney General as of July 8, but we have no way of knowing what the situation may be when the companies make their forthcoming quarterly returns. If there appears then to have been a significant change in the method of handling these purchases or deliveries, we may have to request the Attorney General for a new ruling."

### Controversial Phases

That statement to AMERICAN AVIATION, which has been studying the California tax situation for months, touches on many of the most controversial phases of the problem. Since it was made, no information has been received as to what stand the state expects to take. Also, the treaty has since been signed and submitted for ratification.

It is known that the state has met Federal opposition on the subject before (although nothing as formal as a treaty) and has replied, in effect, "hands off."

The whole issue was considered pretty well settled up to the time the Air Corps Ferrying Command took over the job of delivering the Britain-bound big ships to the British in Canada. That was last June. The question had arisen in April and May. After receiving letters on it from Secretary of State Cordell Hull, Governor Culbert Olson presented the matter to Attorney General Earl Warren back on June 3.

An opinion was remitted under date of July 8 which exempted the form of transaction then in common use (before the Ferrying Command took over) under which "the contract with the manufacturer provided that final delivery meant the delivery of a completed plane in England or the Dominion designated." Regarding this contract, the Attorney General concluded: "It is therefore my opinion that the sales tax does not apply in those cases where delivery of the planes was to a common carrier (railroad or regular steamship line) for ultimate delivery in either England or the Dominions." At the same time, he did not find exemption for airplanes placed aboard British-owned steamships in California ports.

Prime test of taxability under the California statute is whether title actually passes within the state. To concede that title does not pass when the goods are placed in the hands of a common carrier, however, is not an admission that title would not pass in California if the transporting were done by the purchaser or his agents.

### Question of Common Carrier

But what is a common carrier? That is a big question in California. Unless the term could be stretched to include the Ferrying Command, then Uncle Sam's flyers might well be considered agents of one party or the other.

Any attempt to discuss the problem in full ends up in a labyrinth of legal detail. What about lease purchases for instance? That has also been discussed in connection with the sales tax question. It has generally been conceded that since the U. S. government actually retains title to lease goods they are automatically exempt from the tax.

Does the treaty, if ratified, settle the direct British purchase problem for all time? And does the Supreme Court decision on private contractors selling to the government have an effect on lease purchases?

It's a good guess that a lot of study and arguing will result before the many questions involved are finally answered. Meanwhile tax officials in 20 other states with sales taxes on the books sit by wondering where it will all end, and what their future course of action should be.

### Output, Payroll, Personnel

#### for Los Angeles Reviewed

Los Angeles County aircraft manufacturers' backlog totaled \$1,629,945,492 on Oct. 1, according to the Los Angeles County Chamber of Commerce.

September production was \$40,062,822, new orders \$11,427,098 and payroll \$16,894,597. Personnel Oct. 1 aggregated 104,375.

### House Subcommittee

(Continued from page 6)

mittee which has five measures proposing glider training now before it.

Other pending bills awaiting recommendations of the subcommittee include proposals for uniform identifying land markers, for restoration of CAA independence, for use of standard Army and Navy safety devices on airline planes and for receipts for airline fare payments.

Soon after the first of the year several new bills of major importance are expected to be introduced by Rep. Nichols, designed to carry out whatever safety requirements are found to be necessary in the opinion of the Nichols airline accident investigation committee. One of these may provide for complete control by CAA of all airport traffic control tower operations at landing fields on federal airways.

### Plane Builder Lacks

#### A Priority Rating

Shortage of raw materials has extended to rubber bands used in the manufacture of model airplanes, periling, according to Western Coil & Electrical Co., an industry related to national defense.

Asking the Office of Production Management for a priority rating on the item, W. T. Lewis, president, declared "the model airplane is the most definite factor in building up airplane consciousness in the American youth." Lewis said that if his company is not given the priority rating, it will be forced to lay off about 100 employees.



## WRING IT OUT ALL YOU WANT



ALMOST any good plane can be safely slow-rolled by an *expert*. But the Fairchild Trainer was designed with an extra broad margin of stamina for the stresses imposed by the aerobatics of a beginner. After thousands of hours with the Army Air Corps, the CPTP, and the CAA, the Fairchild Trainer has amply demonstrated its tolerance for the abuse of the heavy-handed fledgling, as well as its sensitive response to the precision aerobatics of the experienced pilot.

And, right side up, that wide, rugged landing gear takes five-foot-high landings—prevents ground loops—assures continuous service *in the air*.

### FAIRCHILD AIRCRAFT

Division of Fairchild Engine & Airplane Corp.  
Hagerstown, Maryland . . Cable Address "Faircraft"

## New Air Service Command is Formed to 'Keep 'Em Flying' for the Army

**C**HARGED with serving the Army Air Forces in many of the ways that the Quartermaster Corps serves the Regular Army, a new Air Service Command has been organized at Wright Field, Dayton, O., under the leadership of Brig. Gen. Henry J. F. Miller.

Replacing the old Maintenance Command, which was also directed by Gen. Miller, the new unit will supply, maintain and store materiel and equipment, and provide essential repair services for all Army planes from the smallest trainer to the largest bomber, with the objec-

quired a separate supply and maintenance organization.

Under the reorganization, the Air Service Command directed by Gen. Miller gains importance equal to that of the Materiel Division under Brig. Gen. O. B. Echols. Both of the units will operate as parts of the Air Corps, headed by Maj. Gen. George H. Brett.

Assigned to the Air Service Command to facilitate maintenance and supply operations in all parts of the U. S. and its possessions is the Army Air Corps' wide-flung air cargo system operated by the 50th Transport Wing.

To carry out the important tasks involved in house-keeping for the Army Air Forces, seven divisions have been established in the U. S. and possessions. In continental U. S., Air Service division headquarters have been formed at Hartford, Conn., Spokane, Wash., Tampa, Fla., and Riverside, Cal. In these areas, mobile units will offer maintenance and supply services for field operations. Other districts were set up in Hawaii, Panama and the Philippines.

A new \$2,500,000 building between Wright and Patterson Fields for housing Air Service Command headquarters is now under construction and is expected to be completed within six months. Number of civilians employed by the unit is slated for an increase from 800 at present to a high of 3,200. Prospective employees for supervisory jobs are now in training at air depots throughout the country.

The following staff appointments have been made by Gen. Miller for the Air Service Command: Lt. Col. James W. Spry, administrative executive; Lt. Col. Joseph T. Morris, assistant chief of staff, engineering; Lt. Col. Robert V. Ignico, assistant chief of staff, supply; Lt. Col. J. D. Givens, assistant chief of staff, training and operations; Maj. John C. Gordon, assistant chief of staff, personnel; Maj. L. C. Wilson, chief of military personnel; Maj. F. H. Miller, chief of civilian personnel; 1st Lt. C. Palmer Boyles, assistant to the chief of staff in charge of public relations; 1st Lt. David A. Burchinal, aide to Gen. Miller.



Gen. Henry J. F. Miller

tive of keeping every plane in the Army Air Forces ready to fly at all times.

The now defunct Maintenance Command has been operated for some years as a unit of the Air Corps Materiel Division at Wright Field. Since, however, the Materiel Division has been concerned primarily with experimentation and the procurement of new aircraft, it became apparent that the continuing expansion of the Air Forces re-

## Full Control Ordered Over All Magnesium

THE OFFICE of Production Management last month ordered complete control of magnesium and magnesium products under a program designed to route supplies of the metal into needed defense operations.

The tighter control of magnesium was undertaken in a general preference order directing that all magnesium and magnesium products in whatever form or by whomever held, not being used to fill orders with ratings A-1-j or higher, be reported to OPM before Nov. 30 and be held for sale to a producer or an approved smelter.

OPM stated that the major reason for the new control is that stocks of magnesium exist in this country in various forms and for other than vital defense purposes. Complete allocation of all magnesium on a monthly basis was also provided for in the order.



CAPT L. D. WEBSTER, left, Texas Defense Guard flight commander, and Capt. Claude Seaton, Braniff Airways instrument flying instructor, study a flight problem on the "bug" of the airline's Link trainer recently placed at disposal of guard pilots by President T. E. Braniff. The Braniff Link trainer is available several hours weekly at the airline's Dallas operations base for training of guard pilots in blind flying.

## Activation of Two Complete Wings Strengthens Marine Corps Aviation

**A**S PART of U. S. policy of protecting American interests in far-flung lands, aviation is gaining an important place in the Marine Corps with the activation of two complete Marine wings, one on the East Coast, the other on the West Coast.

Latest moves aimed to give the Marines an effective striking air arm are the creation of the East Coast Wing Headquarters at Quantico, Va., and the approval of plans for the assignment of air groups to the West Coast Wing at North Island, San Diego, Cal.

When present plans are completed, each of the wings will include five groups—two fighter, one scout bomber, one bombardment, and one utility unit, each broken down into squadrons in the same manner as those of the Army Air Forces. Utility groups will be used to transport men and materiel, and perform other odd jobs for tactical units.

The First Marine Aircraft Wing and Second Marine Aircraft Wing assigned to the Atlantic and Pacific Fleets, respectively, are being brought to full strength as rapidly as personnel and equipment become available. Planes used by the Marine

Corps are of Navy design, bought through regular Navy procedure. Likewise, Marine pilots, gunners and crews, while designated as Marines, are trained at Naval pilot centers.

Unlike the semi-autonomous Army Air Forces, Marine aviation will not maintain a separate organization but will function as part of a land division, with each wing under the control of the division to which it is attached.

Two new Marine Corps flying fields have been approved recently. Construction on Cunningham Field at Cherry Point, N. C., is well underway, with work on the New River, N. C. field now starting. The New River field, it is anticipated, will be used for planes assigned to command missions, the training of parachute troops, and the training of air infantry in gliders.

Parachute training is currently concentrated at the Naval Air Station, Lakehurst, N. J., but additional jumping towers are being installed at New River and San Diego to speed the training of Marine paratroops.



'Leatherneck' Paratroops Take to the Air

### Policy at Consolidated

## Priorities for Workers' Wives

### But There's a Reason

SOME 250 women, all wives of workmen in the plant, are now employed by Consolidated Aircraft Corp., San Diego; and nearly 100 more are being accepted each week for factory jobs, company officials announced recently.

Reasons for granting preference to wives or relatives of men already employed at Consolidated, are: 1. to prevent a migration of women from other portions of the country; 2. in the event of U. S. participation in the war, men employees lost to the armed forces will be assured that their families have an opportunity

to sustain themselves; 3. housing and transportation problems are less difficult and women from the local area may be more readily trained in nearby training facilities.

Consolidated frankly admits that in departments where women had been expected to run a poor second to men, results have been overwhelmingly satisfactory. While feminine workers are a bit slower than men in acquiring knowledge of machinery operation, in handwork they are much faster, plant officials assert.

# Shipshape for Pursuit!

Swift and lethal as they look are the P-38 (Lockheed Lightning) pictured here and other U. S. Army pursuit ships. Similar American-built airplanes are now fighting with the R. A. F.

And, thanks to the in-line compactness of their Allison liquid-cooled engines, their designers had free rein to streamline them completely from tail to tip.

Thanks, too, to the cooperative efforts of our Army and aircraft industry, these highly advanced engines are now flowing out of the plant with ever-increasing production.



... IN THE FRONT OF OUR AIR DEFENSE ...

*Powered by Allison*

PLANE  
MANUFACTURER

Bell  
Curtiss  
Lockheed  
North American

AMERICAN  
DESIGNATION

Airacobra  
P-40  
P-38 Interceptor  
Apache

BRITISH  
DESIGNATION

Airacobra  
Tomahawk  
Lightning  
Mustang

You read more and more about these famous fighting planes in the newspapers.

*Allison*

LIQUID-COOLED AIRCRAFT ENGINES

DIVISION OF GENERAL MOTORS





## Meets Housing Shortage

# 1,200 Martin Workers Take New Quarters In Communities of Trailers, Dormitories

**Strategic Defense Center, Remote From Adequate Housing, Is Now the Site of Hundreds of New Homes for Employes**

A CRITICAL defense housing problem has been solved with the occupation by nearly 1,200 Glenn L. Martin employes of emergency living quarters established within easy walking distance of the Maryland plant.

Before the project, there was virtually no available housing closer than Baltimore. And Baltimore is 14 miles away. Martin employment grew rapidly (the company now reports more than 25,000 on the payroll) and most of the workers had to travel the full distance.

Driving out from the city, the shifts of this army of workers formed such incredible traffic jams over the one road to the plant that it was necessary to allow a full hour to travel the 14 miles.

### Three Types

The new housing communities established as a result of this need fall into three main categories as to type of construction.

First, a village of 300 pre-fabricated permanent homes offers housing facilities in the low-rent range of \$30 to \$35 a month. Construction of the project, now known as Stansbury Estates, mushroomed rapidly. The fact that ground was broken May 25 and the houses occupied by Aug. 15 depicts the speed at which the Martin housing problem was handled.

Meanwhile, another group of 300 homes of this type was started north of Plant 1 and was occupied in mid-October. This village is named Aero Acres, and was built near the new four-lane road leading to the plant.

Second, A group of five T-shaped one-story wooden dormitories, somewhat similar to Army barracks, was built by the Farm Security Administration to provide sleeping, recreational and sanitary facilities for 300 bachelor workers. Authorities have tried to plan so that the occupants of each dormitory will be workers who are employed on the same shift, thus guaranteeing the least possible disturbance during rest periods.

### 200 Trailers

Immediately adjacent to the dormitories is a community of 200 trailers, each housing a family or group of four persons, provided by the FSA as emergency housing for additional workers and their families.

Five-thousand-square-foot lots assure adequate room for trailer families and wooded areas and waterfronts nearby offer recreational possibilities. Wooden buildings erected at pre-determined intervals

contain washing, bathing, and sanitary facilities.

Long before large-scale housing needs became imperative, officials of the Martin company had built a community known as Stansbury Manor. This development, illustrating the third construction type, is not in the low-rent range, but rather in the lower-medium brackets. It was completed last year.

Containing 191 apartment and home units of brick, Stansbury Manor is one of the attractive "riviera" communities of Baltimore, with a population of 600. Situated on Wilson Point, jutting into Middle River, the residents enjoy private bathing beaches, their own boating docks, as well as fishing privileges.

### More Facilities Soon

Martin officials add that in the very near future the three emergency developments will also be afforded recreational and pleasure facilities similar to those now enjoyed by the residents of the apartment units that comprise Stansbury Manor.

Meanwhile, approximately 370 workers of the company and their families are residing at Armistead Gardens, the Baltimore Housing Authority Project located on the Philadelphia Road within driving distance of the plant.

## NA Employing Women at Dallas as Experiment

North American Aviation Inc. of Texas, Dallas, last month began hiring women factory workers "on an experimental basis." First 12 are in electric subassembly, but firm officials say women may eventually be used in several other departments.

Company spokesmen said they were well pleased with the results of the first week of the experiment. They added that NA's personnel department will give preference to the wives of men now enrolled in the U. S. military or naval services if other considerations are equal.

## North American Opens Cleveland Branch Office

North American Aviation Inc. last month opened an office in Room 805, Hippodrome Bldg., Cleveland, O., in charge of Albert Gianelli.

Chief function of the branch will be to survey plant facilities in the East with a view to more subcontracting, but in addition it will take over outside production follow-up work previously handled for the firm in the area by Fisher Body Division of General Motors Corp.

North American officials plan to increase the company's subcontracting figure from 30% in October to over 34% early next year.

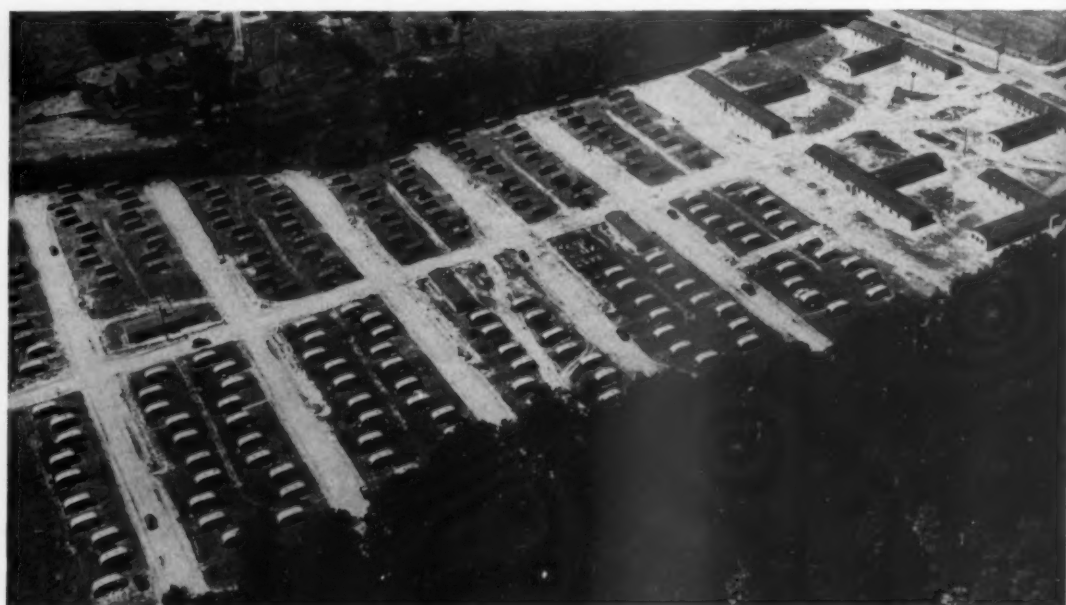
## 'Blind Flying'

*Was Practiced 32 Years Ago*

While warning a graduating class of 251 Aviation Cadets at Kelly Field that America "is preparing now for a long and difficult World War," Maj. Gen. Frank P. Lahm, this nation's No. 1 pioneer in military aviation, added a lighter "then and now" touch.

"I remember very well an October morning 32 years ago, when Wilbur Wright thought he finally could trust me alone with an airplane," he recalled. "The only airplane, by the way, that the Army owned. 'Go ahead and take it up,' Wright said. It doesn't sound much different, does it, than the 'Take her up alone' I hear at Randolph Field? When I think today that I soloed after three hours, I'm amazed now at a young man's daring. The controls of the Wright biplane were the simplest. They manipulated the rudder, elevators, and wings. To keep the plane level we 'warped' the entire wing-surface, which was extremely flexible. Ailerons were unheard of. Cross-country as we know it didn't exist. Dual and solo meant circling 100 feet above an open field, hoping the 35-horsepower, four-cylinder engine would keep the plane going—at a top speed of 42 miles per hour. Can you imagine two students soloing, and then teaching each other the finer points of flight? 'Advanced training' for Lieutenant Humphreys and me was one long voyage of discovery—a trial-and-error process that had more 'blind flying' than we'd like to admit."

## Trailers Meet Emergency Housing Demand



**TRAILER CAMP**—To the pilot over the Baltimore, Md., area they seem to be a cluster of bee hives. Actually they are 200 trailers supplied by the Farm Security Administration for emergency housing of Glenn L. Martin Co. employes. Each trailer is large enough to accommodate a

family, or group, of four persons. In the right background may be seen the five dormitories which provide living quarters for 300 bachelor workers at Martin. Both housing developments are within short walking distance of the plant.

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# New Arrival

Official Photograph U.S. Army Air Corps



*The* delivery of the first AT-11, a twin engine advanced training airplane manufactured by the Beech Aircraft Corporation, Wichita, Kansas, has just been announced by the War Department. This low-wing all-metal monoplane will be used for the specialized training of bombardiers and gunners. It is equipped with flexible guns and bomb racks for the instruction of a crew of three or four men depending upon the instructional mission. The AT-11 has a wing span of approximately forty-seven feet, a length of thirty-five feet, retractable landing gear and twin tail. Power is delivered by two radial, nine cylinder, four-hundred-fifty horsepower Pratt and Whitney engines which operate two two-bladed propellers having a diameter of approximately eight feet."

*{Official War Department description}*

The AT-11 BEECHCRAFT thus joins a distinguished family of other BEECHCRAFTS in service with the Air Corps and the Navy. These others already giving faithful and efficient service are the AT-7 Navigation Trainer, the C-45A Transport, the F-2 high-altitude photo-mapping airplane, the JRB-1 utility observation and JRB-2 Transport (all twin-engine types), and the GB-2 single-engine biplane transport.



BEECH  
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CORPORATION

# Beechcraft

BEECH AIRPORT  
WICHITA, KANSAS  
U. S. A.

## Spreading Defense Work



**STRIVING** to determine what type of defense equipment small manufacturers are capable of producing, the Office of Production Management has dispatched three special trains from Washington on a tour of 79 cities to let manufacturers in different regions inspect the sample war equipment and interview staff members.

Each train is made up of six cars of samples—including bombs, propeller parts, and other aircraft accessories, pumps, photographs, blueprints, and detailed specifications of many additional items—and two cars of living quarters for the staff of the 36 government representatives.

The regular staff of each train includes 16 Army officers, eight Navy officers, a representative of the Maritime Commission, eight representatives of the OPM, and officials of the Treasury and the Office for Emergency Management. Capt. Nathan Brumbaugh, pictured above, left, is one of the Army Air Corps experts traveling on one of the trains.

Train No. 1 is traveling the eastern seaboard; train No. 2 is going through the middle west, and train No. 3 is touring the west coast, returning via the south.

The exhibits will not visit a number of large cities where defense production clinics, serving a similar



purpose, have been or will be opened. Primary purpose of the train tours is to see that no qualified manufacturer misses an opportunity to obtain defense work because he lacks information.

### Saboteur Sentenced

Michael William Etzel, former Glenn L. Martin Co. subforeman, last month was sentenced to a 15-year prison term for sabotage. He was found guilty of cutting wires and stuffing rubber tubing into gasoline tanks of bombers.

## Kellett Officials Ask Consideration of Autogiro's Military Possibilities

**EFFORTS** to interest the Air Corps and Navy in the military possibilities of the autogiro and helicopter are being intensified.

Kellett Autogiro Corp., now largely engaged in subcontract work on orders from such companies as Consolidated, Curtiss-Wright, Martin, Bell, Republic and Brewster, last month declared the Air Corps is giving serious attention to its 'giro. At the same time the firm admitted that the real market for the autogiro will be created after the war when the emphasis in small private ships will be on safety and low landing speed.

### Nazi Surprise Possible

However, Kellett officials declare there is a possibility that Germany will surprise the world next spring with a fleet of "5,000 or more super-autogiro planes." Richard H. Prewitt, Kellett vice president, states that Germany has since the start of the war been striving to build such a craft.

Prewitt, the Kellett company avers, discovered in a trip to Germany shortly before the war that the Nazis were experimenting with a large windmill-blade plane, one capable of carrying 30 men over enemy lines.

"At that time Germany was training thousands of parachute jumpers, but the inability of the chutists to land safely from a plane traveling at a low height was causing many military leaders to frown upon such an offensive method. An autogiro, these leaders thought, would permit a smashing invasion from the air—providing a large ship could be developed.

### Experiments Noted

"Germany was then experimenting with a rotorcraft incorporating a 600-hp. engine which, experts predicted, would be able to carry an 8,500-lb. load. The plane itself might weigh 5,000 lbs. leaving 3,500 lbs. for manpower or guns, or both. This plane, carrying 15 troops, would be capable of also transporting a couple of 'jeeps' or small cannon.

"That was nearly three years ago. It is safe to say that the German engineers have not been wasting their time. It is possible that the 600-hp. autogiro has been perfected, or even bettered."

### Qualities Compared

Comparing the advantages of the autogiro and glider in troop transport, the Kellett company states: "It is believed that 30,000 Germans landed in Crete through the use of gliders, all within a few hours. But once the men landed, the gliders were of no more use. They were abandoned or discarded. An autogiro could be used over and over again if properly protected by an air force strong enough to maintain command of the route of transportation.

"The latest autogiro, with its jump takeoff, could also be used for quick shifting of troops behind the lines. Thus a weak spot could be strengthened without undue delay."

Kellett officials say that the Navy

has virtually ignored the autogiro to date, and asserts that actually the use of this type of plane on a freighter would release aircraft carriers and fighting planes from convoy duty for work at other vital points.

### High Rank for Gen. Andrews

Upon his recent promotion to command the entire Caribbean Defense Area, as well the Panama Canal Dept., Lt. Gen. Frank M. Andrews became the second lieutenant general in the history of the Army Air Corps or Air Forces. The only other air officers with that high rank is Lt. Gen. Delos C. Emmons, head of the Air Force Combat Command.

### Northrop Field Progresses

Northrop Aircraft Inc. reports that work on Hawthorne Municipal Airport, adjoining its plant, is well under way, with completion of the \$150,000 WPA project scheduled for Jan. 1. The airport, to be named Northrop Field, will have a 4,000-ft. runway.

## Directs Mexican Aviation



Col. Alberto Salinas Carranza

Defense requirements, especially those involving the Panama Canal, give Mexico a strategic role in aviation, and the key figure in Mexican air activities is Col. Alberto Salinas Carranza, Chief of Mexican Aeronautics.

One of the oldest flyers on the continent, having received his license in 1912, Col. Carranza is reportedly the first man to use the airplane for war purposes in the western hemisphere, bombarding the federal gun boats off Guaymas during the revolution of 1913.

Col. Carranza is the founder of the Mexican Military Aviation school, and has been Chief of the Department of Military Aeronautics. He is familiar with U. S. civil and military aviation.



# Simplicity

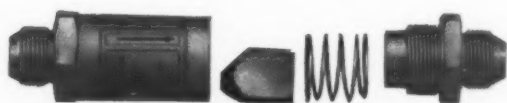
Longer life...less weight...volume production...are achieved through the basic simplicity of the Bendix hydraulic check valve which is being specified as standard equipment on numerous Air Corps and Navy airplanes.

The Bendix valve incorporates a Plastic Poppet\* which "wears in" instead of wearing out. No inserted seats are used as the poppet seats directly in the valve body. The valve is chatter-free at all flows without the aid of dashpots.

Bendix check valves are available for all tube sizes from 1/4 to 1 inch with threaded ends to meet both Air Corps Specification 27993 and AND-10056.













*\*An exclusive Bendix Aviation, Ltd. development, U.S. Pat. applied for.*

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# American Aviation

The Independent Voice of American Aeronautics

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## Fortnightly Review

(Continued from page 1)

no secret in Washington that the Odlum division is still floundering around without knowing the real answer.

Meanwhile, the pressure on Congress is becoming intensified as the economic welfare of "small business" becomes more acute. But the suggestions made in the House by Representative Dirksen of Illinois will not solve the problem if speed of defense production is the primary consideration.

Mr. Dirksen, for example, would like to legislate OPM sufficient authority to compel equitable distribution and diffusion of negotiated contracts in order to give small industries a share in the major defense work. But compulsory distribution of contracts can have only one result—a general retarding of assembly line production. Aircraft manufacturers report today that there is not a major shortage of materials anywhere, but there are delays in getting parts from sub-contractors. To diffuse contracts still further will only impair production. There are too many rejected parts already from sub-contractors without adding still more inefficiency and more inexpert parts manufacturing.

## Going Too Far?

GOVERNMENT officials have let it be known that the next step in federalization of civil aviation may be the certification of all airports. It is assumed that such a move would include the licensing of airport managers. Reason given for such a step is national defense, the need for rigid control over all landing areas in the nation.

There could be no objection against controlling all air traffic in war-time. Such emergency restriction would be necessary. But an over-all certification plan, giving the federal government control over all landing areas, gives rise to grave apprehension. Just where is federalization going to stop? Is it really necessary? A number of states, including Michigan and Massachusetts, license their airports and airport managers and such state control, if properly exercised, seems to us to represent the maximum of regulation in the public interest. Remote control

from Washington cannot possibly be efficient and merely adds another ill-conceived venture by the national government, a venture not asked for by the people and not justified by necessity.

State aviation officials have good reason to be skeptical of this latest bureaucratic proposal and should fight it to a finish. Airport certification sounds innocuous enough, but the next easy step would be for Washington to dictate everything connected with an airport, such as length of runways, type of lights, etc. Federal bureaucracy would infringe upon local rights. The recent CAB action requiring every aircraft and every pilot to possess a federal certificate was a sensible move recognized by everyone, particularly in these times. But let the trend of federalization stop there. In no other realm of American life is there such detailed regulation as burdens aviation today. It is time to call a halt to further encroachment upon individual and state rights.

## Spending Without Planning

OVER 30 billions for air power by 1945?

It's a fantastic figure but not at all improbable. Gill Robb Wilson, president of National Aeronautic Association, has just predicted in one of his addresses that the total defense expenditure will probably reach 100 billions by 1945, of which at least a third will be for air power in all of its manifold ramifications.

"Yesterday's lack of foresight which led to today's unpreparedness should warn us how much we stand to lose if we continue to underestimate the aviation of tomorrow," he said.

Thirty billions in five years! And in the entire twenty years to date the U. S. spent less than \$150,000,000 annually on all aviation. In those twenty years our annual aviation expenditure was only one-fourth the yearly American beer bill, one-sixth of our annual cigaret bill, and just a little more than what our ladies spent yearly on perfume!

Now in the next five years we are destined to spend, expand, produce and develop beyond the dreams of the most imaginative of our flying pioneers.

The moral? This country all but stood still, like England, keeping its aircraft designers and manufacturers in a state just above starvation. We piddled along on air mail and meddled with air transport without providing constructive leadership for expansion. We restricted our efforts to one laboratory of fundamental research and even that one lacked the confidence of the engineering brains of the industry. On practical research the nation has failed sadly and today billions are being spent without the proper follow-up in tests and applications of research for the future aviation of America.

It's a story of glorious expansion which will inevitably thrust all aviation into the top national picture. The government is committed to a continuation of the program into peace-time, but such a program needs planning. With one-third of the defense bill going into air power, it seems only too obvious that real leadership for the aviation of tomorrow is called for—a coordination for the dynamic use of air power not only for the war but for peace.

## Note for the History Book

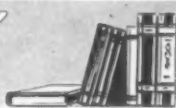
HERE are two enlightening footnotes in the history of air transportation as it progresses, now slowly, now swiftly, toward its destined place as the cheapest form of transportation in the world:

Memo A: A 200-pound passenger with 40 pounds of baggage pays \$139.75 to fly from Washington to Los Angeles. An additional 200 pounds of trimmings (seat, soundproofing, carpet, kitchen, etc.) is required for the passenger's comfort—a total of 440 pounds. . . . Yet a 200-pound package from Washington to Los Angeles by air, requiring little room, no luxurious trimmings and no stewardess, costs \$184. Express rates must come down.

Memo B. Railway express moves at 15 cents per ton mile at an average speed of 45 miles per hour. . . . A cargo plane is available today which can move at 7 cents per ton mile at 200 miles per hour. Major express movement in the future will be by air.

The era of air transport has scarcely opened.

# Bookshelf



**ARE YOU FIT TO BE A PILOT?** by Dr. Ermin L. Ray and Stanley Washburn, Jr.; Wilfred Funk Inc., 386 4th Ave., New York, N. Y.; Illustrated; 61 pp.; \$1.75.

Here is a series of flight physical tests, with a summary score sheet, which you can take at home with the help of a friend, the charts in the volume, and such equipment as you can find around the house. The 12 tests are simple enough for anyone to understand. If the instructions are carefully followed, the results have been proven amazingly accurate, according to Dr. Ray.

The complicated, specialized equipment used during the official tests is here ingeniously reproduced through the use of charts, a cellophane disc, removable measuring scales, four-color plates and a scoring system.

Dedicated to the flight surgeons—the specialists in aviation medicine—this new book contains tests on visual acuity, depth perception, ocular muscle balance, eye accommodation, color vision, hearing, balance, circulatory efficiency, muscular coordination, ability to relax, muscular tremor, and gait.

Dr. Ray is a flight surgeon, U. S. Army Medical Corps; air line medical examiner, CAA; commercial pilot and rated Army pilot, and formerly was flight surgeon of the 119 Observation Squadron, New Jersey National Guard.

Washburn during the last two years has been with American Airlines in New York where he has been in daily contact with the latest developments in aviation.

The volume was illustrated by J. McA. Smiley.

**MAPS, CHARTS AND PROJECTIONS**, by William Alexander and W. J. D. Allan; Chemical Publishing Co., 234 King St., Brooklyn, N. Y.; 91 pp.; \$1.25.

This is the first of a series of books written for observers and pilots of the RAF and RAFVR to help them in preparing for examinations.

The book was prepared by two Britons who have had experience in training hundreds of observers and pilots.

**AEROPLANE HYDRAULIC EQUIPMENT**, compiled by a panel of experts under the general editorship of E. Molloy and E. W. Knott; Chemical Publishing Co. Inc., 234 King St., Brooklyn, N. Y.; 84 illustrations; 132 pp.; \$2.50.

Only comparatively recently has extensive use been made of hydraulically-operated equipment on aircraft, the outstanding example being the retractable undercarriage.

Vol. 10 in the airplane maintenance and operation series prepared by these editors, this is a study of the operation, inspection and maintenance of Lockheed, Dowty and other representative types of hydraulic equipment, with a summary of retractable undercarriages and operating systems.

Many useful diagrams showing the layout of typical hydraulic units are included to simplify the descriptions of these systems.

**FLIGHT: METEOROLOGY AND AIRCRAFT INSTRUMENTS**, by Capt. Bailey Wright, W. E. Dyer, and Rex Martin; American Technical Society, 850 E. 58th St., Chicago, Ill.; Illustrated; 348 pp.

Another instalment in the series entitled *Flight—A General Survey of Fundamentals of Aviation*, this volume, like others, contains quiz questions and answers which follow chapters on:

The atmosphere; major and minor circulation of the atmosphere; atmospheric moisture and weather forecasting; the weather map; airway weather service; how to make maps; airway maps and charts; aerial photography; airway markers and illumination of airways; aviation radio; engine instruments; altitude instruments; navigational instruments; and miscellaneous instruments.

Capt. Wright is with the Private Flying Division, CAA, Chicago; Dyer is instructor in charge of mechanics, Lewis School of Aeronautics, Lockport, Ill.; and Martin was formerly assistant director in charge of airways of the old Bureau of Aeronautics.



**ASTRO-NAVIGATION**, in Two Volumes, by Francis Chichester; Chemical Publishing Co., 234 King St., Brooklyn, N. Y.; Part One, 103 pp.; Part Two, 83 pp.; \$1.25 per volume.

These books serve chiefly to help an observer, who is familiar with dead reckoning navigation, to learn sufficient astro-navigation for position fixing in the air.

Also, these volumes, may be used to aid anyone who wishes to recall his astro-navigation. Only the methods in general practice today are described. The author sets out exactly what must be done to fix position in an aircraft by astro-navigation and the reason therefore.

The author in 1931 was awarded the Johnston Memorial Trophy for astro-navigation, the highest recognition attainable for navigational ability.

**FLIGHT: AIRCRAFT ENGINES**, by Ray F. Kuns; American Technical Society, 850 E. 58th St., Chicago, Ill.; Illustrated; 363 pp.

This volume, another presentation in the *Flight* series, was formerly published by Junior Air Service of America Inc. Designed as an introductory study of aircraft engines for students, it contains quiz questions and answers and includes chapters on the following:

Elementary engines; aircraft engine fuel, mixtures and carburetor design; carburetors, fuel injectors, induction systems and superchargers; ignition; spark plugs, radio shielding and storage batteries; starters, starting motors, generators and accessories; lightplane engines; Lycoming lightplane engines; radial aircraft engines; valve and ignition timing; and lubrication and fuels.

The author is technical editor of *Automotive Digest* and principal of Automotive Vocational High School, Cincinnati, O.

**AIRPLANE LOFTING**, by William Nelson; McGraw-Hill Book Co., 330 W. 42nd St., New York, N. Y.; 82 figures; 147 pp.; \$1.80.

This new book, written by a retired U. S. Navy captain, is the first text on the lay-off of airplanes in the mold loft, and fills the need for such a treatment designed especially for students entering either loft or sheet metal working fields of airplane construction.

Brief descriptions of the design and construction of airplanes are given. Student loftsmen will find geometrical

reviews sufficient for an understanding of the principles concerned.

Model making, plating development, templet making, and photographic reproduction are described to give an understanding of the methods followed by the loftsmen.

**YOUNG AMERICA'S AVIATION ANNUAL, 1941-42**, Edited by Frederick P. Graham and Reginald M. Cleveland; Robert M. McBride & Co., 116 E. 16th St., New York, N. Y.; 246 illustrations; 256 pp.; \$2.

It is the purpose of *Young America's Aviation Manual*, which is published annually, to keep the air-minded reader informed of new developments and to present a dramatic and comprehensive picture of the year's progress in aviation.

Similar in format and treatment to the 1940-41 edition, this year's volume is a completely new book with over 200 new photographs and simple, clear text. Although it covers all aspects of aviation from commercial aviation, the new airports, training schools and gliding, to improved instruments, navigational aids and private flying, the emphasis falls on new production methods and military aviation.

Editors of the book are the past and present aviation editors of the *New York Times*.

**A PILOT'S METEOROLOGY**, by Charles Graham Halpine; D. Van Nostrand Co. Inc., 250 4th Ave., New York, N. Y.; 220 pp.; \$2.50.

Writing for "just average pilots" rather than for the professional meteorologist, the author reduces to simple terms the basic principles of meteorology, avoiding complicated diagrams, mathematical formulae, advanced physics and differential equations.

Purpose of the author, who is a retired lieutenant commander of the U. S. Navy and staff member of the Weems System of Navigation, is to enable those who fly the airways for pleasure or for business to "interpret intelligently and for themselves the various weather reports and weather maps and the actual phenomena appearing before them, to the end that they may be better and safer flyers."

The volume includes chapters on the nature of the atmosphere, elements of meteorology and their measurement, types of clouds, effects of temperature variations, ice formation on aircraft, air masses, fronts and disturbances, and weather forecasting.

## The 'Jitters Test' - - One of Twelve



THE SIMPLEST and one of the most important tests taken by candidates for a license to fly is the "jitters test," above, termed by flight surgeons a muscular tremor examination. It is one of the 12 basic tests of physical fitness given to flying candidates, all of which have been reproduced through a series of charts, color plates, measuring scales and a scoring system in the new book, "Are You Fit to Be a Pilot?" by Dr. Ermin L. Ray, flight surgeon, and Stanley Washburn Jr., reviewed on this page.





## AIRWORTHY

**M**ANY airport visitors who enjoy watching the big transport planes "take off" may not be aware of the interesting story of service and maintenance behind each liner which rolls up to the runway ready for flight.

Before the Inspector certifies a transport as "airworthy" in accordance with Civil Aeronautics Board and airline regulations, the ship has been through the most rigid inspection. Every inch has been gone over by master aircraft mechanics. Controls, landing gear, instruments, radio installation and motors have been tested by specialists and rechecked by inspectors.

Preparing an airliner for a flight is today a highly organized, systematic job. American Airlines, at the New York ter-

minal alone, employ approximately 1000 men in the maintenance of transports. In the shops, motors are taken down, rebuilt, tested under elaborate controls. Engineering advances are continuously being built into the planes, and passenger ships actually grow better in use.

"The inherent utility and public service of air transportation," says President C. R. Smith of American Airlines, "creates increasing demand which will continue to call for larger, faster planes. Maintenance will become more and more exacting, will require constantly greater skill. It is a vocation for ambitious, intelligent men who have a background of sound technical training."

For such men, the future is bright in aviation.



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CASEY JONES SCHOOL OF AERONAUTICS, Newark, N. J.

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President

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## Pro, Con and Otherwise

### Wings and Flaps

SIRS:

It would be appreciated if I may be permitted to correct some misquoted statements made in your issue of Nov. 15.

It was therein stated that the Consolidated B-24 and Model 31 employ the Davis "high lift" wing. It has been similarly stated in other periodicals. The airfoil section as used on these ships has the Davis profile and its high speed and high lift characteristics are inferior to other well known airfoils, but it has a slightly higher L/D ratio at a lift coefficient of about 0.75 which gives it a slightly better cruising range. However, this latter advantage becomes of value only on very large ships such as Consolidated uses.

But the real "high lift" is obtainable only through the employment of the Fowler Flap, of which I am the inventor. Without the Fowler Flap, the Davis wing would not have the "high lift" attributed to it.

The writer is thoroughly familiar with all the facts stated above because he was serving in the capacity of consulting engineer with the Consolidated Aircraft Corp. during the entire development phase of these two ships.

Inasmuch as it is generally recognized that the development of the Fowler Flap is contributing very substantially to the performance of our foremost military aircraft, it is highly inappropriate that its advantages should accrue to another party.

SAN DIEGO, CAL.

HARLAN D. FOWLER

### American Aviation Directory

#### Fall-Winter Issue Is Out

The 1941 Fall-Winter Edition of AMERICAN AVIATION DIRECTORY, revised and considerably enlarged, is now being mailed to more than 1500 advance subscribers.

Although intended primarily to note changes in the industry since the Spring Edition six months ago, the new DIRECTORY is larger by 40 pages and contains 300 firms not previously listed. An estimated 3000 changes have been made in individual names, titles and addresses. Refinements in make-up include the use of Wire-O binding for durability and flat-opening characteristics, addition of tabs between sections for quicker reference to any branch of the industry, and a notation giving telephone numbers along with data on personnel and products of each company.

Used in quantities from one or two up to 30 copies by virtually every firm in every branch of the industry, the new edition is available from AMERICAN AVIATION ASSOCIATES, INC., at \$3 per single copy or \$5 per subscription to two successive editions.

### They Like It

SIRS:

I would like to take this opportunity to compliment you and praise you in the most sincere manner possible for the top-notch job AMERICAN AVIATION is doing in reporting the really important news of the industry. I have never seen a better job of news selection or balance in a magazine.

LOS ANGELES, CAL.

HOWARD W. CHENEY  
LORD & THOMAS

SIRS:

We follow with a great deal of interest the important subjects covered as news items in your AMERICAN AVIATION DAILY as well as your semi-monthly publication. You are doing a splendid job in keeping the industry as a whole acquainted and up-to-date with goings on in Washington as well as national and international developments in the field of aeronautics . . .

THOMAS O. HARDIN, President  
Southwest Feeder Airlines Inc.  
Ft. Worth, Tex.

### Soaring Society Elects; New Association Active

ACTIVE in sponsorship of legislation designed to give the U. S. a glider pilot training program which will surpass the German program is the recently formed American Glider Association, of which Charles T. Malone is president and trustee.

"We firmly believe that glider pilot training makes better airplane pilots; that it is safer than dual control airplane training; that it is more economical than dual control airplane training, both in time and money; and that the youth of America should be taught to build and to fly gliders," Malone stated.

"We believe there are too few boys and girls in this country trained to use their hands—and we think the results achieved by the National Youth Administration in this field have been remarkable.

### Development of Airships

(Continued from page 10)

blimp can go to at least 8,000 feet if necessary.

Although large or rigid airships are not the subject of discussion these days, Capt. Rosendahl believes that large airplane-carrying airships could be of great use in naval defense of the U. S. in particular, and of inestimable help to the British right now in locating surface raiders in both the Atlantic and Pacific.

"But just as we are sadly finding

SIRS:

Please accept yet again my congratulations for AMERICAN AVIATION which I continue to find indispensable.

New York City

JOHN WALTER WOOD.

SIRS:

I have just finished reading the Nov. 15 edition of AMERICAN AVIATION, with the new organization of material and format. It seems to me you have improved the magazine at least 100% and I congratulate you on a fine editorial achievement . . .

WILLIAM L. WILSON  
Director of Public Relations  
Republic Aviation Corp.  
Farmingdale, N. Y.

### Lightplane Show Extended

The second Eastern Light Airplane Exhibition will be held in connection with the National Sportsmen's Show at Grand Central Palace, New York, Feb. 21 to Mar. 1. The committee in charge has announced that a majority of the exhibitors of last year want to exhibit again, having expressed belief that it is highly important to keep the public reminded of the advancement of private plane operation.

We feel that the NYA has the fully equipped shops and instructor personnel to successfully undertake the building of gliders, and the consequent training of airplane mechanics, immediately; and that they can farm out the glider pilot training work in the same manner that both the Army Air Corps and the Civil Aeronautics Administration now do," he said.

New officers and directors of the Soaring Society of America Inc. were announced recently as follows:

Parker Leonard, president and secretary; Arthur Schultz, treasurer; Donald Hamilton and Jay Buxton, vice-presidents; Lewin Barringer, Arthur Schultz, Parker Leonard, Helen Montgomery, Chester Decker and Wolfgang Klemperer, directors; Donald Hamilton and Joseph Steinhauser, directors at large; Floyd Sweet, chairman of the contest committee; and Robert Stanley, Stanley Corcoran, and Floyd Sweet, executive committee.

### Calendar

NOV. 28-DEC. 7—International Aviation Show and Light Plane Exhibit, Convention Hall; Headquarters, Detroit Leland Hotel, Detroit, Mich.

DEC. 1—Air Line Mechanics Association, Annual Convention, Del Prado Hotel, Chicago, Ill.

DEC. 1-2—National Aviation Training Association, Annual Convention, Kansas City, Mo.

DEC. 1-5—American Society of Mechanical Engineers, Annual Meeting, Hotel Astor, New York, N. Y.

DEC. 4—Dedication of New Factory of Curtiss-Wright Corp.'s Airplane Division, Port Columbus, Columbus, O.

DEC. 17—Institute of the Aeronautical Sciences, Wright Brothers Lecture, "New Pathways in Aeronautical Theory," by Richard Southwell, Professor of Engineering Science, Oxford University, England; at the Pupin Physics Laboratory, Columbia University, New York, N. Y.

JAN. 9-11—All-American Air Maneuvers, Municipal Airport, Miami, Fla.

JAN. 10-11—Dedication of Bomber Assembly Plant to be Operated by North American Aviation Inc. at Fairfax Airport, Kansas City, Kan.

JAN. 12-16—Annual Meeting and Engineering Display, Society of Automotive Engineers, Book Cadillac Hotel, Detroit, Mich.

JAN. 27—Institute of the Aeronautical Sciences, Honors Night Dinner, Hotel Waldorf-Astoria, New York, N. Y.

JAN. 28-30—Institute of the Aeronautical Sciences, 10th Annual Meeting, Pupin Physics Laboratories, Columbia University, New York, N. Y.

APR. 23-25—5th Annual Southwest Aviation Conference, Hotel Muehlebach, Kansas City, Mo.

APR. 23-25—Women's National Aeronautical Association, Annual Convention, Hotel Phillips, Kansas City, Mo.

MAY 1-2—3d New England Aviation Conference, Providence, R. I.

### Obituary

MACK R. CARLIN, 40, test pilot for Canadian Colonial Airways and a flying companion of the late Frank Hawks, died of a heart attack in New York City on Nov. 20.

BENJAMIN W. JAMES JR., 33, aircraft design engineer, died in Los Angeles on Nov. 9 following a long illness. He had been chief engineer for Kinner and a designer for Howard Hughes before joining Lockheed Aircraft Corp. in 1938.

LT. COL. WERNER MOELDERS, 28, said to be Germany's most successful war ace with destruction of 115 fighter planes in two wars to his credit, was killed at Breslau on Nov. 22 in a transport crash. Germany's greatest pilot in the World War, Baron von Richtofen, shot down 80 enemy planes.

COL. GEN. ERNST UDET, 45, noted flyer in the World War and the leading creator of the present German air force, died on Nov. 17, according to reports from Berlin. Conflicting reasons were given for the death of the German pilot who held his country's highest decoration for bravery. Gen. Udet was known to many in the U. S. aviation industry.



## Coming Out of Seclusion . . .

## Aircooled Motors Expands, Looks to Future

By WAYNE W. PARRISH

A SMALL company which has forged a place for itself in the aircraft engine business by dint of courage, imagination and brains, opened a 32,000 sq. ft. plant addition at Syracuse, N. Y., on Nov. 8.

Compared to the huge plants opened up in the industry this year, the Aircooled Motors plant seems mighty small, but the engineering and production significance of Aircooled make it a giant in its own field and no one under-estimates the future importance of the new plant.

## Chairman's Name Secret

The industry as a whole has never known much about Aircooled. Even the name of the chairman of the board is kept secret by the firm. Financial and other statements have been non-existent. But throughout the nation on airports from coast to coast the name of Aircooled is known, for lightplane pilots like the engines and Aircooled has found a market for itself amid heavy competition.

Testimony to the company's growth is the new plant addition, devoted entirely to engineering and research. Built and equipped at a cost of \$250,000, with no financial help from the government, Aircooled will move more intensively into planning and building small engines for the future airplanes of the nation. The new test cells are without equal anywhere and the research equipment will give Aircooled an edge on delving into new designs.

The Nov. 8 "housewarming" was

Doman, vice president and chief engineer, an old Franklin Motor man who is rated by his associates as one of the best engineers in the country.

President of Aircooled is a man who might have been a playboy but wasn't—dapper Lewis E. Pierson, Jr. Son of the chairman of the board of Irving Trust Co. in New York, Pierson was one of the founders of the defunct NYRBA airline to Buenos Aires which was absorbed by Pan American Airways. He remained with PAA for a number of years as head of the Rio de Janeiro office, then looked around for an aeronautical outlet in the U. S.

## Took Over Franklin

He and his unnamed associate, chairman of the board of Aircooled, set upon Franklin Aircooled Motors and took over what remained of the engine company and set up shop in a small way on the outskirts of Syracuse. Doman was the main-spring on the engineering side, Pierson gave the proper drive to the business side.

Sales Manager Carl Roth has seen to it that most private pilots know about Aircooled and the company's 1941 production of between 2,300 and 2,500 aircraft engines is sufficient evidence of growth. Official figures are non-existent but Pierson reported the company's backlog to be about \$1,000,000. This includes an Army order for a series of engines up to 500 hp. in size.

## Known for 65-HP. Job

Aircooled is known most right now for its 65 hp. engine, but the sales on the 90-hp. jobs are increasing. For example, Stinson Aircraft recently signed an order for 500 of these. Also in production is a 130-hp. engine but there is no current market available. The company

a reliable engine cheaply enough to keep the prices of his planes down. Since then, Aircooled has edged its way into Aerocas and Taylorcrafts but not in such large quantities.

Any visitor to the plant is impressed first of all by the closely-knit organization and the loyalty of the executives to one another and to the tough job ahead. Pierson is frank in saying that his biggest job is trying to peer into the future and anticipate industry developments. Will light airplane companies be absorbed by large corporations? And will lightplane manufacturers eventually manufacture their own engines? These and other questions are not easy to answer and no one knows more than Pierson the very tough job Aircooled has had getting underway and finding a niche in the field.

At the housewarming there was one man who looked on the affair with proud eyes. He was William

E. Pierson, Sr., one-time president of the United States Chamber of Commerce and long a prominent industrial and banking figure in the country. He thought his son was learning fast and doing well. Despite the money background of Aircooled, however, the company has scraped along on the very minimum of budgets, has never spent a cent it didn't think it had to spend. It is likely now, however, that Aircooled may rise out of its seclusion and start getting a little attention. It has reached its main market—the lightplane field—but has been almost unknown in the industry at large.

With a capacity of 7,500 aircraft engines a year, Aircooled hopes the military services will buy quantities of light planes. Aircooled won't get all that business, but it will certainly get its share. Its floor space now totals 72,000 sq. ft. and it's ready to start expanding again.

Formation of Vega Aircraft Corp.  
Planned With Lockheed Merger

FORMATION of a new corporation, Vega Aircraft Corp., is planned if stockholders of Lockheed Aircraft Corp. approve the merger of that company with Vega Airplane Co. Stockholders of the latter firm have voted overwhelming approval of the proposal, but the Lockheed meeting was postponed pending receipt of additional proxies.

As the Lockheed vote was set for Nov. 27, shareholders should have passed on the merger by the time this appears in print. Approximately 150,000 additional proxies were needed in order to obtain the two-thirds of outstanding shares necessary for ratification of the proposed action.

The new corporation would be 100% owned by Lockheed and would be charged with carrying out the obligations and operations presently undertaken by Vega. A letter to stockholders of Lockheed stated, "It is believed that by this means the production facilities of the two companies will be used to the greatest advantage and assurance provided that expanding financial requirements will be met and the delays and confusions caused by the possibility of conflicting interests eliminated."

In consummating the merger, Vega shareholders will receive one share of Lockheed stock for each three shares of Vega held. As of Sept. 30, Vega owed Lockheed \$30,971,488 and the latter's management stated that requirements "have now developed to such an extent that the board of directors of Lockheed now considers that further sponsorship of and financial assistance to Vega by Lockheed should not continue unless the ownership of Vega properties and responsibility for its operations be completely assumed by Lockheed . . ."

A comprehensive picture of how officers and directors of the two companies will fare in the merger insofar as present stockholdings are concerned is also revealed in the letter which lists share beneficial ownership in the companies on Sept. 30 as follows:

Lockheed: Robert E. Gross, director, president, 29,669 Lockheed shares and 8,978 Vega shares (Mary Gross, wife, holds 1,463 Lockheed and 77 Vega; Marian Gross, daughter, holds 150 Lockheed); C. A. Barker, Jr., director, vice president, treasurer, 550 Lockheed, 3,500 Vega (Ruth F. Barker, daughter, holds 1,000 Vega; A. Jean Barker, daughter, holds 1,000 Vega); Carl B. Squier, director, vice president, 3,002 Lockheed, 500 Vega; Hall L. Hibbard, director, vice president, 7,000 Lockheed, 5,467 Vega; Cyril Chappellet, director, secretary, 9,407 Lockheed, 3,741 Vega; Richard A. Von Hake, vice president, 428 Lockheed, 528 Vega; L. W. Wulfekuhler, assistant secretary, 843 Vega; R. C. Walker, director, 500 Lockheed; and D. E. Browne, principal accounting officer, 200 Vega.

Vega: Courtlandt S. Gross, director, president, 5,671 Lockheed, 3,800 Vega (Alix D. Gross, wife, holds 200 Lockheed, 300 Vega); Mac Short, director, vice president, 300 Lockheed, 14,931 Vega (Mae B. Short, wife, holds 300 Vega); Barker, director, vice president, (same as above); H. E. Ryker, vice president, 100 Lockheed, 775 Vega; Chappellet, director, secretary, (same as above); Robert E. Gross, director, treasurer, (same as above); Hibbard, director (same as above); Squier, director, (same as above); and Wulfekuhler, assistant secretary, (same as above).

Those officers and directors not listed are reported as not holding any stock in either company.



AT AIRCOOLED MOTORS' party, left to right: Lewis E. Pierson Jr., president; William Burrows, assistant chief engineer; Carl Roth, sales manager; Carl T. Doman, vice-president and chief engineer.

a cozy affair, held in competition with football games and the launching of the 140,000-lb. Martin Mars flying boat in Baltimore. But there was no lack of local civic celebrities, and Thomas H. Beck, president of Crowell-Collier Publishing Co., was the chief speaker. Perhaps the proudest person present was Carl T.

hopes to sell it to Piper Aircraft for its projected 4-place private airplane.

Aircooled looks up to William T. Piper as a godfather, for it was Piper who gave the company its first big order and initial encouragement. It's been good business for Piper, too, because Piper has gotten



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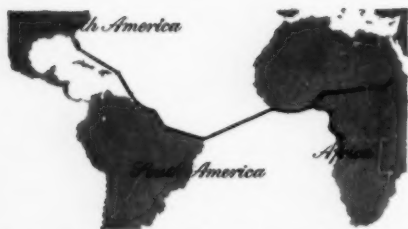


LOCKHEED AIRCRAFT CORPORATION • BURBANK, CALIFORNIA, U. S. A.





## AMERICA'S NEW LIFELINE TO AFRICA



ON AUGUST 18 President Roosevelt announced plans for the world's most ambitious airways project. It called for two things: First, a new air transport service from the U. S. to Africa and on across the Dark Continent to Egypt. Second, a new aerial "ferry service" linked with that system, delivering military planes to the Middle East.

To Pan American was entrusted the building of this airline over 11,898 miles of ocean, jungle and desert. Normally it would have taken years. Pan

American got operations going in 60 days!

The White House statement on this undertaking reads in part: "The ferry system and the transport service provide direct and speedy delivery of aircraft from the 'arsenal of democracy' to a critical point in the front against aggression. The importance of this direct line of communications between our country and strategic outposts in Africa cannot be overestimated."

Pioneering is an old story to Pan American. A story made familiar through building 75,000 miles of aerial routes throughout Latin America, over the Pacific, up to Alaska and across the North Atlantic.

Cooperating with Uncle Sam and with our friendly neighbor nations is also nothing new. For example, Pan American recently took over thousands of miles of Nazi-controlled airlines in South America. Urgent defense needs were also met in linking Singapore and Manila by Clipper; in improving scores of airports.

One thing is sure: America's need of an efficient,

strongly welded international air transport service will be even greater tomorrow than it is today—for both commerce and defense. You can be certain that "America's Merchant Marine of the Air" will continue to anticipate the future and be ready with the necessary personnel, facilities, and experience.



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## Thompson Aircraft Products in Operation at New Plant as DPC Allots More Funds

FIRST operations have begun at the new \$11,000,000 plant of Thompson Products' subsidiary, Thompson Aircraft Products Co., Euclid, O., according to F. C. Crawford, president of the parent firm.

The new factory, which was financed by Defense Plant Corp. funds, will make a wide range of aircraft parts, including sodium-cooled valves, fuel pumps and propeller parts. Annual capacity of the plant has been estimated at between \$22,000,000 and \$30,000,000.

Coinciding with the start of operations was the announcement of the Defense Plant Corp. that it had allotted \$1,682,133 for additional facilities, bringing total cost of the unit to \$12,880,605.

### Officers Named

Officers of the subsidiary are: L. M. Clegg, executive vice president; A. T. Colwell, vice-president, and J. D. Wright, secretary-treasurer. These officers will continue to serve the parent company in the same capacities. Wright is also vice president and general manager of the new concern.

Operating heads of the subsidiary include E. A. McBride, plant manager; P. B. Lerch, general superintendent; E. F. Gibian, chief engineer; J. G. Moore, production manager; A. D. Messner, assistant to general manager, and G. N. Hackett, purchasing agent.

Meanwhile other aircraft facility expansions continued at a rapid pace as OPM announced that 26 projects costing \$69,997,000 were approved during September. These included 13 publicly-financed expansions costing \$69,803,000 and 13 privately-financed projects costing \$194,000.

### Ratio of 360 to 1

This indicates a use of approximately \$360 worth of public funds for every dollar of private money during the month, against a ratio of nine to one during the entire period from June 1940 to Sept. 30, 1941.

Defense Plant Corp. allotments for aircraft facilities during the past few weeks include:

**Delco-Remy Division, General Motors Corp., Anderson, Ind.,** \$378,120 for machinery and equipment to be used in the production of aircraft magnetos.

**Ex-Cell-O Corp., Highland Park, Mich.,** \$2,300,000 for constructing and equipping a plant to be used in the production of aircraft engine parts.

**Chandler-Evans Corp., Dayton, O.,** \$1,145,127 for constructing and equipping a plant to be used in the production of aircraft carburetors and fuel pumps.

**Consolidated Aircraft Corp., San Diego, Cal.,** \$245,100 increase in previous \$18,162,943 allotment for additional facilities to be used in the manufacture of airplanes and parts.

**Bohn Aluminum & Brass Corp.,** \$3,935,000 for construction and equipment of aluminum extrusion plant at Adrian, Mich., and \$5,538,000 for an aluminum extrusion plant at Los Angeles, Cal.



RAPIDLY nearing completion one mile from the present plant of Fleetwings Inc. at Bristol, Pa., is this 170,000 sq. ft. unit which is being built at a cost of \$2,750,000. Fluorescent lighting will illuminate the windowless plant which will be used for the final assembly of airframes and parts.

## Top Executives Quit Air Associates Posts

TWO TOP officials of Air Associates Inc.—F. Leroy Hill, president, and Harold I. Crow, vice-president—last month resigned to fulfill a War Dept. prerequisite for return of the seized aircraft parts plant to private control.

The Bendix, N. J., factory, which holds \$5,000,000 worth of aviation orders, was taken over by the Army Oct. 31 after a succession of CIO strikes.

Hill stated that "in order to comply with the demand of the War Dept., the board of directors of Air Associates have insisted that Mr. Crow and myself resign our official company positions. Both Mr. Crow and myself have no alternative under the circumstances but to accept the decision of our board of directors in order to protect the company interests."

Meanwhile, Rep. J. P. Thomas (Rep., N. J.) protested to Undersecretary of War Robert Patterson against the "shotgun notice" to the company's directors, adding that the ouster request was an act of coercion.

## Aviation Corp. Takes Over Its Subsidiary

AVIATION Corp. on Nov. 30 took over all of the assets and business of its wholly-owned subsidiary, Aviation Manufacturing Corp., and began operating Lycoming and Spencer Heater Divisions of the subsidiary directly as divisions of the parent company.

The parent concern has been operating the two plants of its Republic Aircraft Products Division, Detroit, since acquisition in Aug. 1940. Another newly-organized, wholly-owned subsidiary, American Propeller Corp., is building an experimental plant at Toledo, O., and will lease, through the Defense Plant Corp., a large plant being built there for the manufacture of hollow steel propeller blades.

In addition to these divisions, Aviation Corp. has large holdings in Vultee Aircraft Inc., New York Shipbuilding Corp., Auburn Central Manufacturing Corp., American Airlines and Pan American Airways.

## Vultee—Consair

(Continued from page 1)

purchase. Rumors also had linked Consolidated and Lockheed.

Holdings of almost 50% in Vultee are held by Aviation Corporation, which also has a controlling interest in American Propeller Corp.; Lycoming Division, aircraft engine manufacturer; Republic Aircraft Products Division; and Spencer Heating Division, and has large holdings in American Airlines, Pan American Airways, New York Shipbuilding Corp., and Auburn Central Manufacturing Corp.

Consolidated changes hands boasting a backlog of more than \$750,000,000 the largest in the industry. Its delivery rate Oct. 1 was more per month than the dollar volume of its deliveries during the first 10 years of the company's existence, beginning in 1923, according to statements by its officers. In the first six months of 1941, Consolidated experienced the greatest boom in its history, booking orders totaling \$467,000,000.

Full text of the joint statement by the two presidents

"Of our own volition," stated

## Total Vultee Personnel At 3 Plants Hits 9,250

Vultee Aircraft Inc. personnel at Vultee Field, Nashville and Detroit plants last month reached 9,250, with the monthly payroll aggregating \$1,475,000.

Backlog on Oct. 1 was \$161,400,000; September output was \$3,700,000 and new orders for the month totaled \$652,800.

association of our own companies," and adding:

"The facilities, products, proximity of location and experience of Consolidated and Vultee so complement each other as to make possible the more expeditious completion of our defense assignments.

"However, the initial steps of this transaction, the terms of which are not fully agreed upon, contemplate the purchase by Vultee Aircraft, Inc. of the stock of Maj. Reuben H. Fleet and others.

"The present negotiations are between Vultee Aircraft, Inc. and



Maj. Fleet

Major Fleet, as an individual, and not with Consolidated Aircraft as a corporation.

"In the event the transaction is consummated it would be the desire of Vultee that the extensive knowledge of Major Fleet be available in an advisory capacity for a substantial period of time. Any other statements are premature and were not authorized by either party."

## Retirement Income Plan Adopted by Consolidated

Consolidated Aircraft Corp. last month adopted a retirement income plan for the managerial and supervisory staff, with persons earning \$3,000 a year or more, and who have been with the firm at least a year, eligible to participate.

Employees will contribute 3½% of monthly salaries up to \$250 a month and 7% of earnings in excess of that amount. The corporation will contribute enough to produce a monthly retirement income equal to 1% of the first \$250, plus 2% of the excess earnings, multiplied by the years of participation.

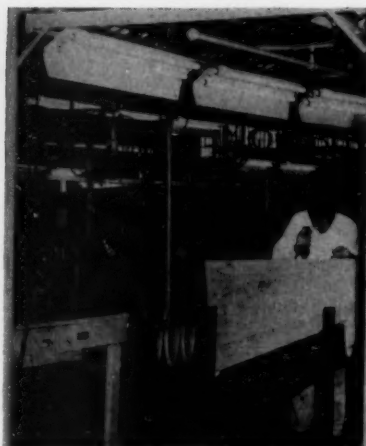


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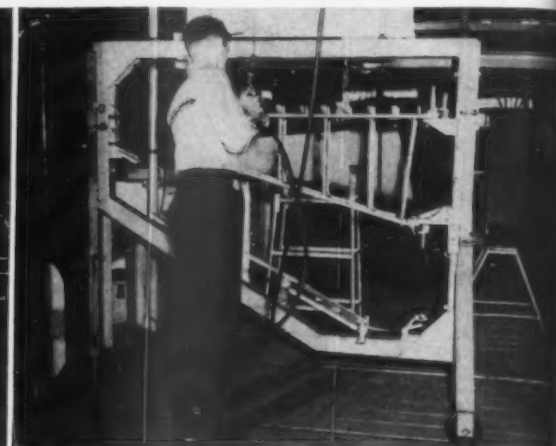
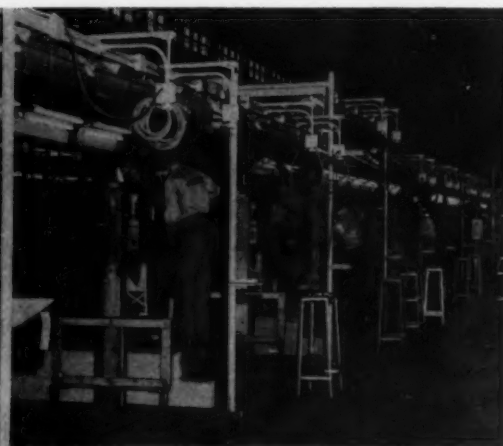
Fleet and Millar, "we have for some time been mutually exploring business aspects of a possible future



# Subcontractors Adopt Moving Assembly Line] Methods



Assembly Lines Triple Parts Output



'Dimpling' a Frame

STRAIGHT-LINE flow of production in airframe plants having become an accepted method of manufacture, the trend is now toward the technique of assembling airplane parts on portable jigs.

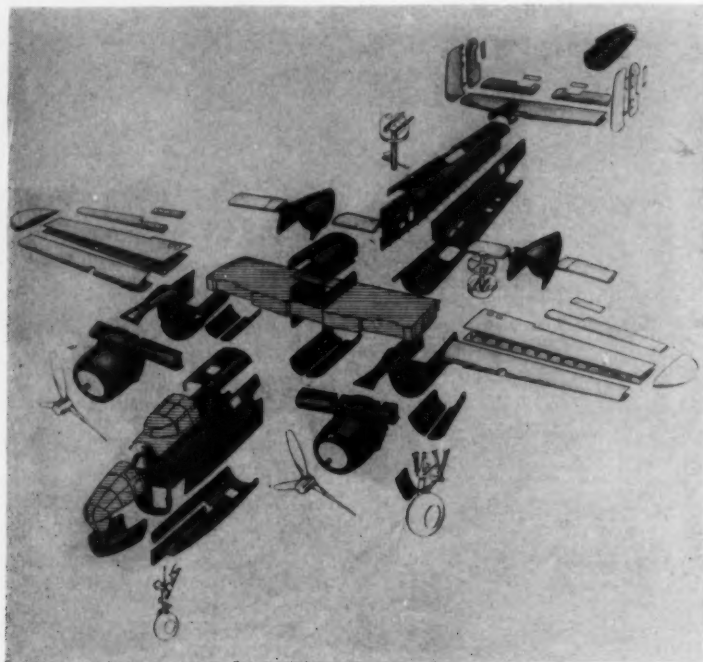
The news comes from Fleetwings Inc., Bristol, Pa., that output of

subassemblies for Brewster, Douglas, Martin, Republic, Vega, Vought-Sikorsky, and Vultee has been more than tripled following the introduction of six final assembly lines, each for the production of a certain type of control surface.

Fins, elevators, stabilizers, and rudders—of various sizes and types—are all completed on the new lines. On each line is located a number of portable jigs or assembly frames. Line workers operate in pairs, at their respective stations, and as they complete their work

they move the jig to the next pair of workers. When a job arrives at the end of the line, completed, it is removed and the jig is rolled back by means of a transfer car to the line's first station, ready for another trip down the line.

## Subcontracting Forms Jig Saw Puzzle New Bearing Inspection Process to Cut Engine Failures - -Allison



LIKE a jig saw puzzle, this breakdown chart of North American's B-25C medium bomber illustrates the extent to which subcontracting is being carried out in aircraft manufacturing under the defense speed-up. Dark and light-shaded areas of the chart depict parts and assemblies furnished by Fisher Body Division of General Motors on a subcontractual basis in six plants in various parts of the country. Fisher Body, in

turn, sub-contracts the job to hundreds of smaller plants throughout the country. White areas—landing gear, propellers, gun turrets—indicate purchased parts. Result: only major assemblies that are built in North American's Kansas City factory are the bombardier's and pilot's enclosures, tail cone, and a section of the center section.

### Sailplane Plant Burns

A \$25,000 fire last month gutted Frankfort Sailplane Co.'s plant at Joliet, Ill., and hastened transfer of the firm's activities to its new 20,-

000 sq. ft. factory adjoining the Lewis School of Aeronautics, Lockport.

The new unit is scheduled to be completed later this month.

ALLISON Division of General Motors Corp. last month reported perfection of a new process for inspection of bonded bearings "that will be the means of preventing some of the inexplicable airplane engine failures, commercial as well as military," and added that the development will be made available through the Air Corps to other manufacturers.

The firm explained that in the manufacture of bearings the most exacting control of processes can minimize the possibility of poor bonding between the bearing surface material and the shell, but that no one has ever had any means of inspecting the finished part which would guarantee the bearing against possible failure resulting from poor bond.

Destruction of a percentage of the bearings was the only means of measuring the efficiency of the process, and experience has indicated that under the most ideal conditions approximately 1% of the production might still be questioned. The development of a fool-proof, inexpensive and highly-practical way of instantly and positively catching the infinitesimal hidden flaw that might lead to serious engine failure is of inestimable value, Allison said.

The company disclosed that it had received Air Corps permission to inspect, with the new process, the bearings in engines now in the hands of airplane manufacturers as rapidly as possible and that all Allison bearings now leaving the Indianapolis plant have passed through the new test.

"This new inspection will not materially affect meeting the scheduled production of fighting planes in the U. S.," Allison declared.

"Only one plane manufacturer who considerably ahead of schedule, has used up the bank of Allison engines at his plant may be forced to curtail completion of some planes while the engines are being reinspected. With present ability of Allison to produce engines this lag can be taken up in a short time."

### Menasco Turns to Hydraulic Struts As Major Business

PRODUCTION of hydraulic landing gear struts hereafter will be the major business of Menasco Manufacturing Co. of Burbank, Cal., originally established as a manufacturer of four and six-cylinder inverted, inline engines.

Started as a supplementary venture a little more than a year ago, strut production has increased to a point where 56,000 sq. ft. of floor space, under a lease agreement with the Defense Plant Corp., is being added to the present strut plant to provide a total floor area of 82,000 sq. ft. This addition, together with machinery and a metallurgical laboratory will cost \$1,650,058.

New machine tools will put the company in position to produce landing gear for four-engine bombers and passenger transport. While the company is initially producing only shock struts, it is setting up facilities to handle the complete landing gear assembly.

The company has retained the services of Wilbur G. Wood, formerly hydraulics staff engineer at Lockheed Aircraft Corp., to head the engineering department of the hydraulic strut division.



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## AIRACOBRA BUILDS MILE-HIGH RAKPART... IN TWO MINUTES FLAT!

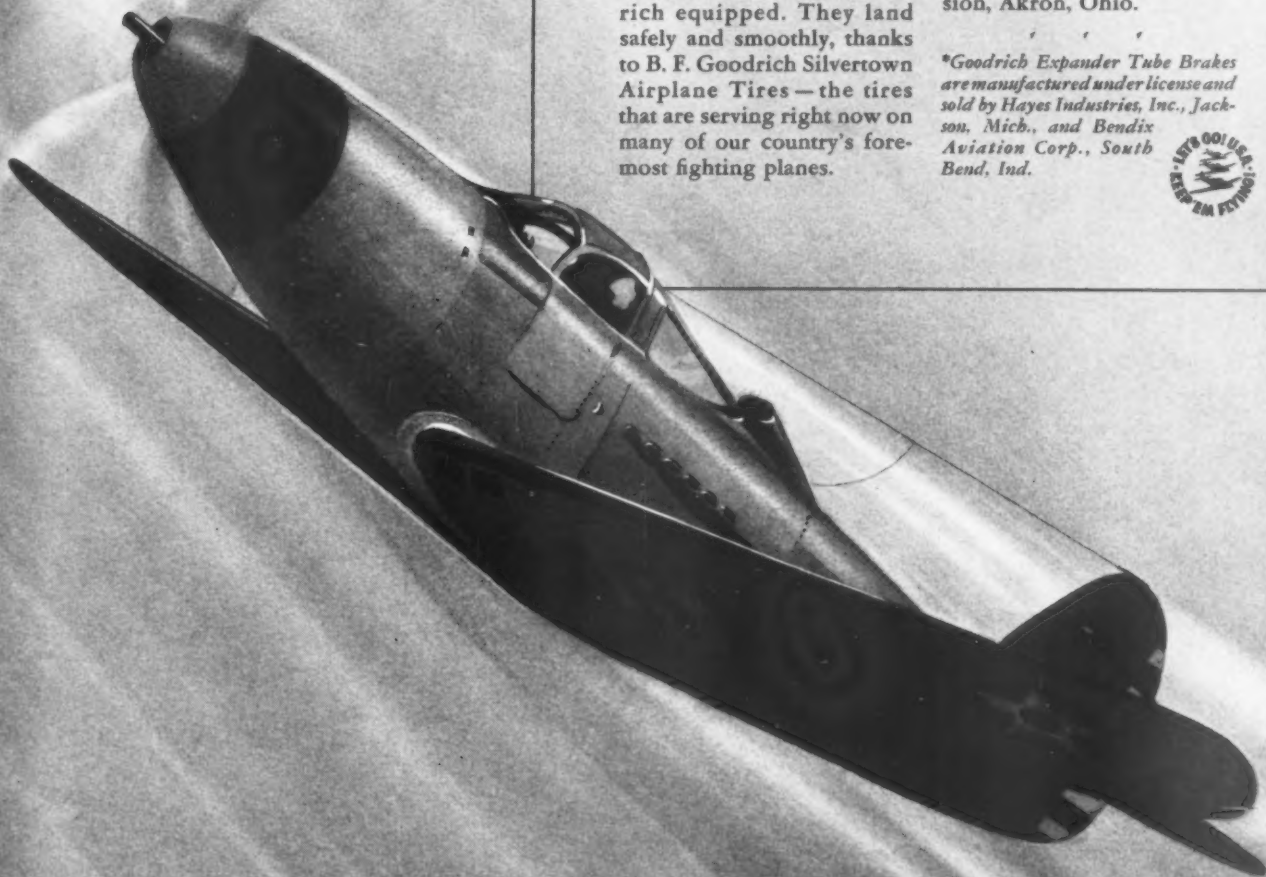
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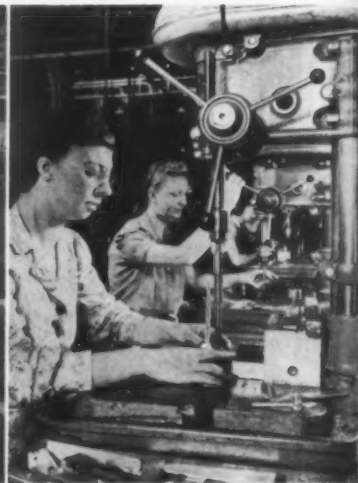
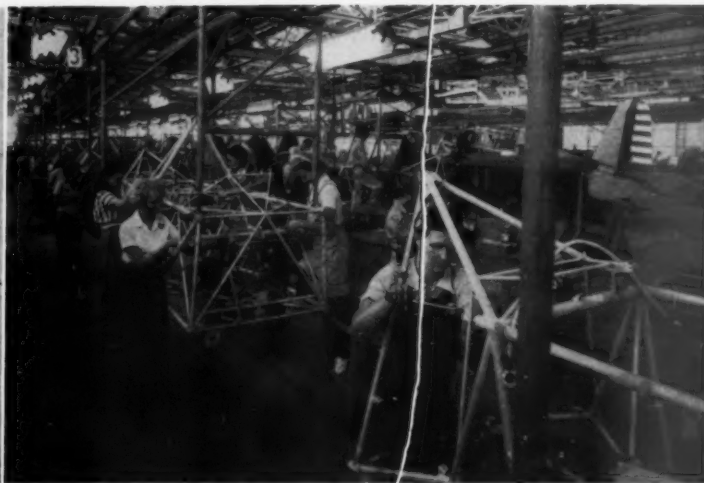
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## Production Trend . . .

# More Women Step Into Man-Sized Aircraft Jobs



## C-W Calls P-40F 'Hardest Hitting' Fighter in World

ATTAINMENT of full production on the Curtiss Hawk P-40F for the U. S. Air Forces and the British was announced last month by Curtiss-Wright Corp., which states that the new, faster and more heavily armed version of the P-40 is the "hardest hitting fighter in the world."

The pursuit features firepower six and two-thirds that of its original predecessor, the P-36, which carried one .30-caliber and one .50-caliber machine gun.

Curtiss-Wright claims that the P-40F will outshoot any combat plane of its type in the air, that it will compare favorably in speed with any other fighter, and that it can go into action at a ceiling comparable with aircraft which it will meet in combat.

First military aircraft type in the U. S. to be powered with the Packard-built Rolls-Royce Merlin engine of British design, the P-40F is believed to have a top speed 23% greater than the 325 mph. maximum of the P-36, or slightly under 400 mph. Service ceiling 70% higher than that of the original type is claimed for the new pursuit.

Particular significance is attached to the powering of the "F" series with the Merlin engine. Unofficial but reliable estimates have placed the critical ceiling of the "E" series using the Allison engine at 17,000 ft.

The Merlin engine effects a substantial increase in the critical altitude.

## NA of Texas Delivers 50 Trainers in One Day

North American Aviation Inc. of Texas, Dallas, on Nov. 22 delivered 50 advanced trainers to the Air Corps and Navy, exactly one year after the first structural steel was unloaded at the plant site.

Production is reported considerably ahead of schedule.

WOMAN'S new-found role of aircraft shop worker is receiving more and more notice within the industry. In its Oct. 1 issue AMERICAN AVIATION covered this important production trend, only now in its first stages, and evidence continues to come in concerning it, as may be seen in the pictures on this page.

The picture at the upper left shows a woman employee working on a Martin bomber control surface at the Fairchild Aircraft Division of Fairchild Engine & Airplane Corp., Hagerstown, Md., the first eastern aircraft firm to report employment of women on jobs ordinarily filled by men.

Other pictures illustrate the activity of women workers at Vultee Aircraft Inc., Vultee Field, Cal., reportedly the first aircraft company to hire girls in quantity for actual shop work. The first girls were hired at Vultee for such tasks as riveting, welding and drill press work more than six months ago.

### Considerable Skepticism

Early in the defense program there was considerable skepticism as to whether women could materially aid the contemplated aircraft labor problem. Significant was a Labor Dept. study which revealed that women could perform many production tasks in aircraft.

That same conclusion is gradually being reached within the industry. Most expressive recent statement to that effect comes from J. Carlton Ward, Jr., president of Fairchild.

"We are beginning to find," reports Ward, "that there seems to be no work dependent upon skill and dexterity that women cannot be taught to do very well."

In fact, Ward reports women to have superior tactile sense and much greater patience at repetitive tasks than men. He also praises women for their ability to follow instructions literally and skillfully.

"There is no reason," adds Ward, "why American women with the superior experience they have had by living in a home full of mechanical gadgets from sewing machines to vacuum cleaners, will not



make even more valuable workers in the U. S. aircraft and engine industry than their sisters in England and France."

In the Fairchild factory the first women hired may be seen doing much of the same type of work being done by men. Several riveting teams consist of a man and a woman, the company reports.

As concrete proof of Fairchild's satisfaction with women workers, the company within the next few months expects to have several hundred women on the payroll, doing such tasks as riveting, sheet metal work, wood working, and setting up work on jigs.

### 350 at Vultee

Meanwhile, at Vultee, where 350 women are on the shop payroll, a six-month report states that women are being used on some 30 different types of direct production jobs, and in almost every manufacturing department.

In addition to the advantages in employing women workers, brought out in AMERICAN AVIATION's previous article, Vultee officials report that women have less tendency than men to move from plant to plant. Labor turnover statistics at the Vultee plant show that the percentage among women is exceptionally low compared to men.

Moreover, women workers at Vultee are reported to have proved themselves ambitious in that the number of women taking advantage of free trade extension training classes is greater in proportion to employment than the number of men enrolled in the courses.



## Pittcairn-Larsen Now AGA Aviation Corp.

PITCAIRN-Larsen Autogiro Co. Inc. has become AGA Aviation Corp., the latter firm announced in November. Management of the company, of which Harold F. Pittcairn continues as a director, will follow the same policies as heretofore and operate in the present expanded facilities at the existing plant location.

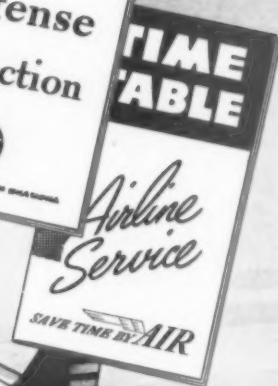
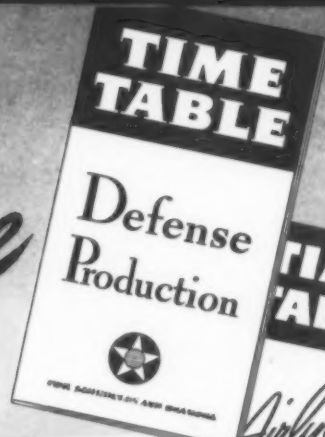
Virgil H. Frazier will remain president and general manager. Paul Thomas vice president and secretary and G. B. Knecht treasurer. No changes will be made in plant personnel. Company is presently producing military planes for both the British and U. S. governments, and expects a considerable expansion in activities and personnel in the near future.

## Bendix Begins Construction of Million Dollar Addition

Bendix Aviation Corp. has reported start of construction on new factory addition near the present plants of Eclipse Aviation and Pioneer Instrument Divisions, Bendix, N. J.

The DPC-financed unit will cost approximately \$1,000,000 and contain 114,000 sq. ft., including 68,000 sq. ft. for instrument manufacture.

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of the essence



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## Personnel on the Move

Formerly head of Stinson Aircraft Division of Vultee Aircraft, C. M. Kaltwasser has been appointed vice president and general manager of Fleetwings Inc., Bristol, Pa. The following officers and directors of Columbia Aircraft Industries, Portland, Ore., have been elected: J. S. J. Hlobil, president and general manager; Ralph T. Montag, 1st vice president; George H.



Kaltwasser

Wisting, 2nd vice president; D. W. Johnson, secretary; Guy R. Harper, treasurer; and J. C. Landrud, assistant secretary and assistant treasurer. Directors: Harry K. Coffey, Arthur L. Fields, Guy R. Harper, Robert E. Hannel, J. S. J. Hlobil, D. W. Johnson, Ross McIntyre, Paul B. McKee, Ralph T. Montag, and George H. Wisting.

New officers of Michigan Wire Cloth Co., Detroit, are: A. A. Bull, president; S. W. Farnsworth, treasurer; and Harold A. Wilson, vice president and general manager. W. H. Blodgett continues as head of the sales department.

Appointment of E. A. Berry as plant superintendent of the new aviation hydraulic division of Chicago Pneumatic Tool Co. at Garfield, N. J., is announced.

Paul M. Dollard has been elected secretary-treasurer of Adel Precision Products Corp., Burbank, Cal., having severed a 17-year connection with Sanderson & Porter, New York firm of industrial engineers.



Bull



Dollard

Marvin W. Davis, former assistant to the supervisor of inspection in the methods and standards department of Studebaker Corp., has been appointed sales manager of Suprex Gage Co., Pleasant Ridge, Detroit, Mich.

Sales engineer with Crobalt Inc., since its establishment in 1932, Cliff

Bendle has been appointed sales manager with headquarters at the company's new plant in Ann Arbor, Mich.

R. Warner Ring, treasurer of Intercontinent Aircraft Corp., Miami, Fla., has been elected to the board of directors. He will continue in the office of treasurer. With his election, the board is now composed of six members: William D. Pawley, chairman; Bruce G. Leighton, president; Paul R. Scott, H. H. Hector, and R. V. Waters.

Curtiss-Wright Corp.'s Propeller Division has named Samuel S. Tyn, Fall, former aviation editor of the Indianapolis Times, as assistant to the manager of public relations.

Fairchild Engine & Airplane Corp. has elected as a director J. Ashton Allix, vice president of Grace National Bank.

## Adel Precision Extends Incentive Plan to 1944

Adel Precision Products Corp. has extended its tentative incentive plan signed in April to May, 1944, thereby putting into effect a contract providing weekly bonuses for exceeding production quotas and barring strikes for the next 30 months.

The company declares that increased tooling efficiency and improved production methods have combined with the incentive plan to lift deliveries far more rapidly than the increase in number of employees. Deliveries in the three months ended Apr. 30, 1941, were \$594,996, against \$1,316,605 for the quarter ended Oct. 31, up 121%. During the same period personnel increased from 518 to 657, or about 26%.

## Wright's Lockland Plant Attains Mass Production

Wright Aeronautical Corp. last month reported attaining mass line production of 1,700-hp., 14-cylinder Cyclone engines at its new Lockland, O., plant.

The factory now employs over 7,000 workers and will have 12,000 by March. Production peak at the plant is expected late in the spring when it will be turning out engines for the Douglas B-23, North American B-25, Douglas A-20A, Martin PBM-1, Curtiss SB2C-1 and other planes for the Army and Navy, as well as for several bomber types used in the RAF.

## Ft. Worth 'Twin' Nears Completion



Erection of the heavily insulated acoustic side walls is progressing rapidly at the Ft. Worth bomber assembly plant, a windowless layout comprising 2,000,000 sq. ft. of floor space. Placing of structural steel for the 22,000-ton framework was completed in mid-November. The Ft. Worth plant, which Consolidated Aircraft Corp. will operate, and its twin Douglas plant at Tulsa, were designed by the Austin Co.

## Company Sidelights

### Douglas Workers in Four Plants To Share Million Dollar 'Dividend'

DOUGLAS Aircraft Co. last month announced that a "defense dividend" of over \$1,000,000 will be paid 35,000 workers in the firm's Santa Monica, El Segundo, Long Beach and Tulsa plants on Dec. 12. All persons in the company's employ Nov. 19, except the president and executives on his payroll, will receive an extra week's pay, not to exceed \$50.

Total payroll for the four Douglas plants in the fiscal year ended Nov. 30 was approximately \$53,000,000, indicating an average annual wage of \$1,905 per employee based on the year's average employment of 28,000. This is an increase of 18% over the \$1,614 average in 1940. Current average pay rates of Douglas workers are 22% higher than in Jan. 1941.

Present production schedules call for a total employment of 40,000 workers by the end of December and 75,000 by the end of 1942.

### Three Canadian Firms Boost Pay for 10,000

THREE Canadian aircraft companies in the Montreal area, Noorduyn Aviation Ltd., Fairchild Aircraft Ltd. and Canadian Vickers Ltd., last month signed a new agreement with the International Association of Machinists (IAM) providing higher wages for 10,000 employees, retroactive to July 1 and effective until June 30, 1942. Workers covered represent approximately one-third of total personnel in the Canadian aircraft industry.

New rate for beginners is 40c an hour, against 35c under the old scale. New minimum for learners, who are promoted from the beginner category after three months, is

45c, up 5c over the former rate. This compares with a 60c minimum for beginners, rising 5c every month until a rate of 75c is reached, under the wage stabilization agreement signed by major Southern California companies in September.

Majority of the employees at the three Dominion plants affected work 54 hours (including six hours of overtime), six days a week.

### NA Personnel Rising Rapidly at 3 Factories

North American Aviation's Inglewood, Cal., plant on Nov. 1 had 14,521 employees, an increase of 1,408 since the last census Oct. 15, bringing the total for all three NAA factories to 20,421.

On Oct. 15 alone 208 persons were hired at the Inglewood plant, boosting the total hired for the week ended Oct. 18 to 782. Of the plant's personnel, 9,198 are on the first shift, 5,195 on the second and 128 on the third.

At North American's Dallas, Tex., plant, 5,321 workers were on the payroll as of Oct. 24, up 307 in one week. (Total is now well over 6,000.) Personnel was divided: first shift 3,475, second shift 1,812, third shift 34.

The company's Kansas City, Kan., bomber assembly plant, now nearing completion, employed 579 persons on Oct. 31.

### Doak Employing 75 Men on Trainer, Parts Work

Doak Aircraft Co. Inc., Hermosa Beach, Cal., reports 75 men currently employed in production of aircraft parts, including the crew working on the firm's plywood training plane. Backlog totals \$370,000.

## Canada Speeds Production



LAST EIGHT of 25 Harvard advanced trainers to be produced by Noorduyn Aviation Ltd. in October are shown awaiting delivery. Of the 100 Harvards turned out by Noorduyn during the first 10 months of 1941, 80 were built between July 1 and Nov. 1.

# CAB Action Seen in '42 on Pick-Up Routes

## Tom Hardin Answers 'Feeder' Line Critics As Applications Mount

WITH applications piling up on its roster, the Civil Aeronautics Board is preparing to take steps designed to dispose of the unsettled air mail pick-up problem.

These "feeder" applications now on file or to be filed—mostly for pick-up and delivery of mail and express, but some proposing passenger stops—cover roughly 42,000 miles of routes with more than 1,500 stops in 34 states.

Amazing growth of interest in pick-up is evident, considering that AMERICAN AVIATION on Apr. 15 reported that pick-up applications covered 22,000 route-miles in 29 states.

The 42,000 route-miles now requested exceeds the entire domestic airline system—which is about 40,000 route-miles.

CAB analysts, it is revealed, are quietly preparing a report on the pick-up situation. Operations of All American Aviation, only pick-up company now in the field, will play a big part in the report.

Exact form of the study is not known, but it is certain to contain economic data on AAA's routes, and may in a round-about way attempt to tell prospective operators what attributes their lines should have in order to stand a chance.

Following completion and circularization of the report, the applications will be set for hearing, probably next year. Whether they will be heard individually or collectively has not been decided.

### Hardin Answers

Last week from the pick-up industry came the first answer to criticism and to hesitancy on the part of some government officials to give this movement serious consideration.

This expression of views, made in answer to a request by this magazine, came from Thomas O. Hardin, member of the former Air Safety Board, airline executive, U. S. trouble-shooter on the Latin American airline situation, and president of Southwest Feeder Airlines.

Said Tom Hardin: (1) after looking at air mail rates (which may be "perfectly justified") paid to or proposed by U. S. domestic airlines, the cost of pick-up does not appear so much out of line as some people claim; (2) "we completely disagree" with those who claim there is little chance of reducing costs of pick-up operations through development of non-mail revenues; (3) air express will constitute a big part of pick-up revenues; (4) pick-up is the only means by which first-class mail can be transported by air; (5) feeder lines are admittedly experimental, but not

nearly as much so as were the original domestic airlines; (6) the necessity for "subsidy" can eventually be eliminated.

Fourteen companies (15 including All American) have either filed applications or indicated their intention of doing so. Among them is Mid-Continent Airlines, the first domestic airline to seek entry into the pick-up field.

### Companies Listed

Companies include Aero Pick-Up Service Corp., Automatic Air Mail, Mercury Development Corp., Page Airways, Southern Aviation Corp., Southwest Feeder Airlines, West Coast Airlines, Mid-Continent, Century Aviation Co., Galveston Truck Lines, Southeastern Air Express, Western Feeder Airlines, Hawthorne Flying Service and Des Moines Flying Service.

Three of these were filed last fortnight: Mid-Continent, for 4302 miles of routes covering 152 stops in Minnesota, Iowa, Illinois, Missouri, South Dakota, Nebraska, Kansas and Oklahoma; Century, for 1500 miles of routes covering 85 stops in Iowa, South Dakota and Nebraska, and Page for five routes and 94 stops in New York, New Jersey and Vermont.

Referring to reports that some officials feel that the 40c mail pay (or 36.6c if Post Office messenger service is furnished) recently awarded All American Aviation is high for the service rendered, Hardin pointed out that an established through carrier is receiving 38c per mile and is asking 44c.

### P.O. Revenue Up

"Furthermore, the record indicates that the mail revenue accruing to the Post Office Dept. from All American's operation must be equal to, or in excess of, that received from several of the trunk line operators," he said. "If it is reasonable to assume that the ratio between the per-mile pay set by CAB and the revenue returned to the Post Office is significant, why should the rate set for AAA be considered high, but fair and reasonable in the other cases?"

Although the feeder airlines, whether pick-up and delivery or short-haul passenger, mail and express, "is admittedly a new development and therefore experimental to a degree, we feel nevertheless, that it is not nearly so experimental as the original operations conducted by all existing air carriers at the time of their inception," he added. "Certainly the value of air transportation is fully appreciated by the public at large. Equally as certain it is that the public has and will make extensive use of the service when it is made available, whether for the carriage of passengers, mail, express or all three. This has been clearly demonstrated throughout the history of existing operating companies and the latest type of service inaugurated by AAA has emphasized this fact in a most conclusive way.

"I am also convinced that the amount of revenue per mile re-

(Turn to page 46)



# Proposed Feeder Network

Applications in Eastern Half of U. S. as of June 1 Shown Below;  
West Coast on Opposite Page.





## Migrating Fowl—Flight Problem

# Bird-Proof Windshields Expected Soon

By LEONARD EISERER

**T**HE chances are excellent that planes will soon gain complete supremacy over the birds.

One of aviation's "lighter touches" of the past fortnight came in the report that an "enemy" sparrow forced down a big Army observation plane by crashing through the windshield and prompting an emergency landing on a highway.

This incident illustrates a bewhiskered but serious flying problem to which much expert study will be given by the airlines and CAA within the next few months.

From aviation's earliest days the threat of feathered flocks downing planes has been ominous, but with the number of bird-plane collisions increasing year by year the matter is becoming increasingly bothersome.

Although to date such a collision has never been adjudged the cause of any fatal airline accident, the seriousness of this problem is evident from the fact that "bird trouble" is now being investigated as a possible causative factor in the fatal accident of American Airlines near St. Thomas, Ontario, Oct. 30.

Effect of a recent head-on meeting of an American Airlines Flagship with a sea-duck, or coot, is shown in the accompanying picture A. The collision, in which the windshield was badly broken through, occurred about midnight Nov. 11 at 4500 feet over Knoxville, Tenn.

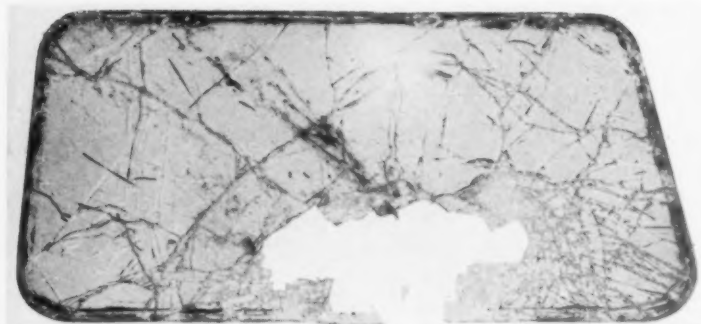
### Battered Wings

Other incidents have been reported by airlines in which migrating ducks have battered plane wings, in one case a duck completely penetrating the leading edge and lodging within the airfoil.

While impacts with other parts of the plane are a bit more frequent, windshield incidents are usually far more serious because of their effects on the pilots.

Encounters between birds and planes in mid-air are described in records compiled by M. G. Beard, chief engineering pilot for American Airlines, based on experiences of various airlines throughout the country since 1939. Despite the fact that some of the smaller lines keep no records whatsoever of these incidents leaving the compilation incomplete, Beard's survey includes an imposing total of 61.

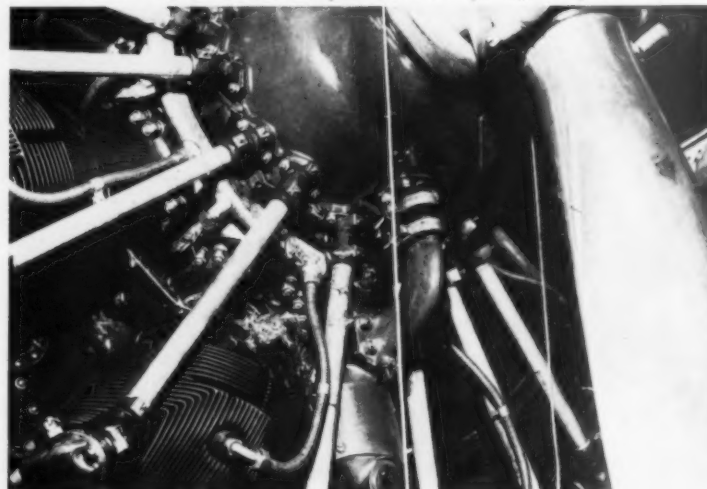
Breakdown of Beard's figures indicate clearly that the biggest hazard from birds exists at night. Of the 61 instances, 38 or about 62% occurred at night, 23 or 38% during the day. This proportion is fairly well in line with migratory habits of birds, since migration experts estimate that about two-thirds



A. Shattered airplane windshield and the coot that did it



B. The worst of three impacts made by migratory robins



C. A migrating robin nests in an engine cylinder

of such flock movements take place after dark.

According to Dept. of Agriculture migration authorities, the possibility of bird-plane collisions is greatest at around 1000 feet altitude—the most common level for mass bird movements. Migrations at over 3000 feet are considered rare, although lone birds are to be found considerably higher.

While the 61 cases on which data have been gathered by Beard do not represent a complete report of actual hits in the past few years, analysis of the totals does give some indication of how the present windshield glass stands up against the impacts. Of the 61 hits, the windshield was struck 27 times for 44% of the total, other parts of the plane being damaged in 34 instances for 56% of the total.

### 27 Instances

In the 27 instances where birds struck the windshield, the glass was damaged as follows: broken and shattered 10 times, cracked 8 times and undamaged 9 times. From these figures Beard draws this conclusion. It can be expected that something like 40% of the birds contacted by transport planes will strike the windshield, and about 35% of these will break through or shatter the present windshield glass.

The search for bird-proof glass for windshields has been a long though ingenious one of trial and error. Experimentation has ranged from splattering tomatoes on paper bags filled with water against windshield glass to shooting small chickens out of air guns similar to measure impact resistance. Twenty-five pound shot bags, put packs, and rubber balls of varying sizes and consistencies have also been used to test the strength of windshield materials.

Ultimate purpose of all these experiments carried on over a period of years was of course to simulate the forces imposed by bird impact upon the glass, so to determine the thickness of laminated glass needed to stop the largest bird encountered.

The earlier tests were found to give entirely erroneous results since the consistency of the projectiles was not at all comparable to that of live, fast flying birds. From recent experiments conducted at the Mellon Institute of Industrial Research, University of Pittsburgh, four fundamental conclusions were drawn which are expected to guide future efforts to lick the bird problem. These results, reported by Beard at the recent ATA engineering and maintenance conference in Cleveland, are:

1. The breakage resistance of glass at normal incidence is very much greater for liquid missiles than for solid.

2. At 45 degrees incidence and high velocities of impact, the breakage resistance of glass is enormously greater for liquid missiles than for solid missiles.

3. At velocities of over 70 mph (Turn to page 47)

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# PREVIEW OF TOMORROW!

THROUGH THE WORLD'S LARGEST DOOR

A TRIBUTE to Martin engineers and workmen was the Navy's order to create the world's largest flying boat. The mighty XPB2M-1 introduces a new era in over-ocean flying. Your Navy, in foreseeing the need for such a plane, displayed the vision which has made American ships . . . both of the sea and of the air . . . second to none. In the XPB2M-1 the Martin Company has done more than give America a great new weapon . . . It has given the world a preview of the even greater flying boats yet to come . . . The Glenn L. Martin Company, Baltimore, Maryland, U. S. A.

# Martin

## AIRCRAFT



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## Expanded Air Cargo Activity Urged

(Continued from page 1)

are thinking of the air cargo field is a patent secured by Harlan D. Fowler, inventor of the Fowler Flap, for a "container type" cargo ship. This revolutionary twin-engined ship, of 14,000 lbs. gross weight, would carry five containers, forming part of the fuselage. Each container would hold 1,000 lbs. of cargo. Upon arrival at an airport, a container for that city would be removed, and one for onward transportation substituted.

As far as CAB is concerned, the air cargo field is wide open. The Board had scheduled an investigation into the contracts between Railway Express Agency and the airlines but it is now revealed that this has been indefinitely postponed at the request of the lines. Recently, four airlines formed Air Cargo Inc. to survey cargo possibilities. Through the Air Transport Association, CAB received word that the airlines would be in a better position to present evidence at the REA hearing after the Air Cargo investigation was completed.

Several months ago, CAB found that REA technically was an "air carrier" but decided that it was not entitled to a "grandfather" certificate. REA is now operating under an exemption, which may be canceled at any time, but which was generally assumed to be effective until the results of the contract investigation became known.

### Investigation Postponed

Indefinite postponement may mean a year or more, during which time REA will continue to operate as at present. But this does not mean that the situation will remain static. The only monopoly existing is through REA's contracts with the airlines, CAB officials point out. These contracts, which forbid the airlines from dealing with anyone else, may be canceled by either party on six months' notice. But even these contracts may not necessarily stop CAB from allowing others to enter the cargo field.

Advocates of air cargo NOW were not the least bit perturbed last fortnight by REA's announcement that air express is booming—shipments in the first nine months of 1941 up 26% over 1940, poundage up 50%, gross revenue up 42.7%. They merely pointed an accusing finger at U. S. airline statistics for September, just released. Of \$9,889,212 total revenues, only \$287,611—or 2.9%—came from air express. They also called attention to the Air Forces which, with 51 airplanes, is estimated to have hauled 6,790,000 lbs. of cargo in the first six months of 1941, compared with REA figures of 4,620,077.

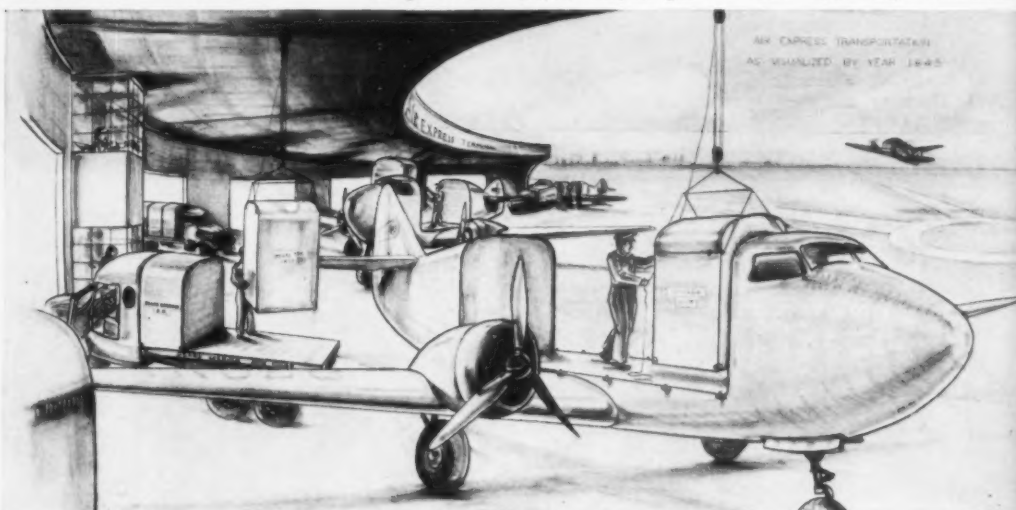
### Adams Testifies

Said Seaboard President Alvin P. Adams at the CAB hearing: "We propose an emphasis on air cargo equal to the emphasis on passenger business. . . . We seek, if possible—and we believe it is possible—at once to plant our company on an economic basis which is free from governmental support, other than that support which measures the fair cost of the service performed in handling the mail."

Probably the most astonishing part of Adams' testimony was the

sidered by Seaboard to make the cargo operation feasible includes the Curtiss-Wright 20 (43,000-lb. gross load, 38 passengers, 265 mph. top speed), now in production for the Army; Lockheed 44 (40,000 lbs., 40 passengers, 296 mph. top), and Douglas DC-6 (36,000 lbs., 36 pas-

have to secure only 1.75 to 2% of the daily express shipments out of Florida to more than fill its plane for the northward trip. Accepting packages on a "deferred shipment" basis should also be considered by any prospective operator, he urged. On Nov. 14, Universal A



Harlan Fowler's Vision—'Container-Type' Cargo Planes

statement that Seaboard would carry cargo (initially on the same planes with passengers) at 20¢ per ton-mile, some 75% under present rates of 85¢. A 20¢ rate would in many cases be as cheap as rail express.

Seaboard Airways was originally started by Seaboard Airline Railway but the two were recently divorced by U. S. District Court. The airline is now being financed through Ladenburg, Thalmann & Co., New York financial house.

Significant was Adams' statement that as long as railroad control was exercised, his air cargo plans had been stymied. Only after the court action was he able to have a survey conducted and announce the proposed cargo service.

### Railroad Reluctant

"My consideration of this matter with the receivers of the railway company indicated a reluctance on their part to propose an operation which would constitute a direct and effective competition with Railway Express Agency operations conducted on their own railroad and with the air express operations conducted by that agency," he said.

According to the "perfectly astonishing" survey, Seaboard found that at 20¢ per ton-mile it could expect between 23,000 and 24,000 lbs. of cargo to travel over its routes daily, at the beginning of service, Seaboard witnesses said. The New York Times alone would ship 15,000 lbs. between New York and Washington and 4,000 lbs. New York-Miami six days a week. Flowers, fresh vegetables, racing forms, fish, department store goods and many other products would take to the air, it was asserted.

Flying equipment being con-

sengers, 286 mph. top). L-44 and DC-6 design work has been completed. Said Adams of the DC-3: "We feel it is obsolete."

### Loening Accuses

Grover Loening, appearing at the Seaboard hearing as a consultant for the company, accused present airline managements of not being "air cargo-minded," of passing the buck to REA, which has a "monopolistic set-up." In forming Air Cargo Inc., the airlines have merely "made a gesture," possibly to "ward off" other interested parties, he charged.

Inasmuch as the established airlines "have nothing to contribute" to national defense in the way of cargo carrying, a new company should explain its set-up to the Army, stressing defense value, and attempt to secure a few of the CW-20's now being manufactured, Loening recommended.

Stressing the point that the Germans used transports for carriage of troops and cargo in the invasions of Norway and Crete, he stated that now—and not after the emergency—is the time to develop cargo routes.

### Advises Against REA

"It would be most unwise, if I may venture to express the opinion, for any new air system, any new company, to adopt this Railway Express contract procedure, and exceedingly desirable for CAB to encourage to the utmost any airline with sufficient courage, progressiveness and farsightedness, to pitch right in now into cargo-carrying possibilities, in a manner wholly and utterly divorced from the Railway Express contract monopoly set-up," he said.

Seaboard, Loening added, would

Freight Corp. made its official for entry into the ground side the air cargo business. The company, a subsidiary of United States Freight Co. (freight forwarder) has since last summer been in business, but unofficially, as far as CAB is concerned.

In filing for a certificate, UAF made it clear that it was not operating aircraft "nor does it intend to seek a certificate to operate aircraft. . . ." It would solicit freight throughout the U. S., such freight being picked up by motor cycles, motor vehicles or messengers employed by UAF or affiliated companies.

### UAF Application

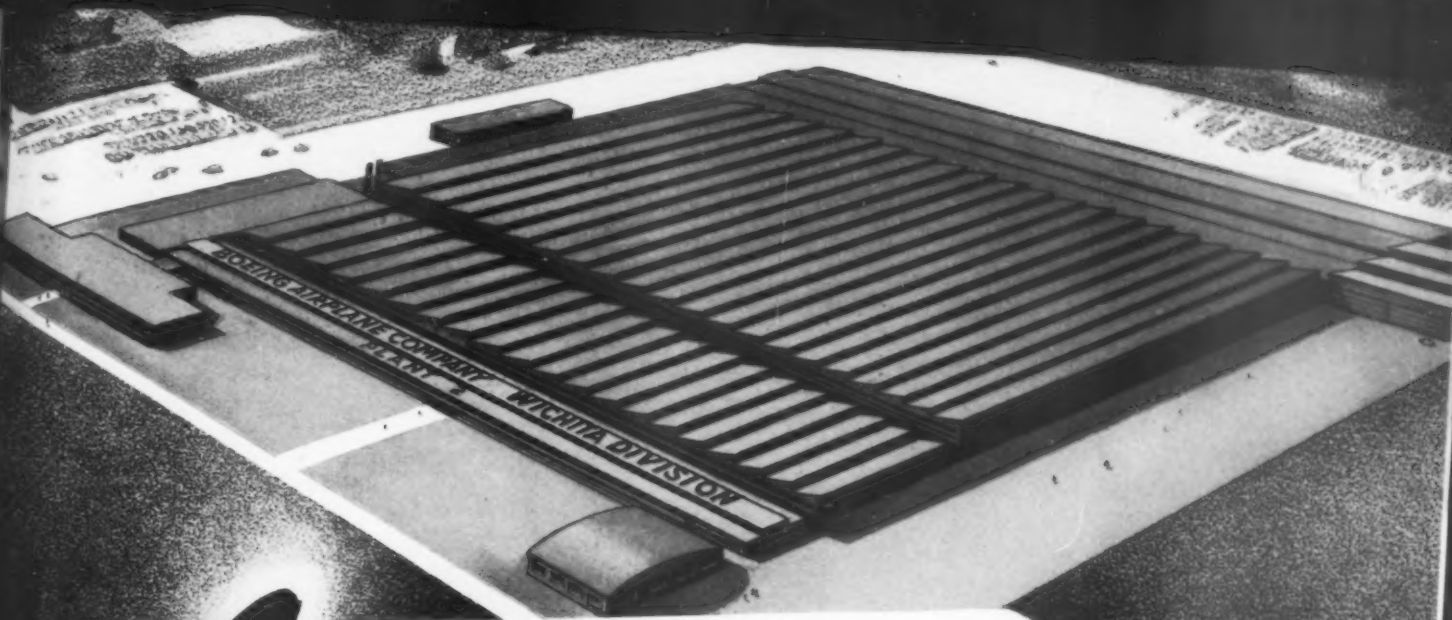
"Applicant has been unable to enter into any direct arrangements with the existing airlines due to an exclusive contract which they have with Railway Express Agency," application said. "It has been necessary, therefore, for applicant in order to gain experience and make a survey of the potentialities of freight to operate within the sphere of the Railway Express Agency volume rates, and the rates on small packages."

"Applicant believes that its operations could be more economical at lower rates could be charged to the public if it were permitted to enter into contracts with the existing airlines whereby the latter would be paid compensatory charges for the air carriage, and applicant would receive compensatory rates for the service it performs, namely solicitation, pickup and delivery, receiving, rating, billing, tracking, handling of claims and other operations."

(Turn to page 45)



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# Action IN THE MIDWEST

**BOEING'S WICHITA DIVISION CONTINUES  
TO SET DEFENSE PRODUCTION RECORDS!**



FORTRESS WING TIPS FROM THE WICHITA  
PRODUCTION LINE



PRESS BRAKES FORM A LINK IN THE  
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MEN AND MACHINES UNITE TO BUILD  
GREAT BOMBERS

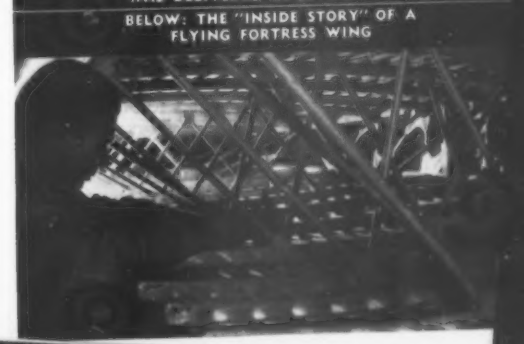
**B**OEING'S WICHITA DIVISION, first to complete 2,000 air-  
planes for the U. S. Army and Navy under the national  
defense program, is keeping ahead of delivery dates on pri-  
mary trainers, while contributing to the Seattle production  
of 4-engine Flying Fortresses. Now this midwestern "Arsenal  
of Democracy" is being extensively enlarged by the construc-  
tion of a new Wichita Plant 2 which will equal the size and  
productive capacity of Boeing's great Flying Fortress factory  
in Seattle. Large completed sections of this new plant are  
already in full production for national defense.

**Boeing**  
AIRPLANE COMPANY

Seattle, Washington  
Wichita, Kansas  
Vancouver, B. C.



ABOVE: THE 2000TH PRIMARY TRAINER  
WAS DELIVERED AUGUST 27, 1941



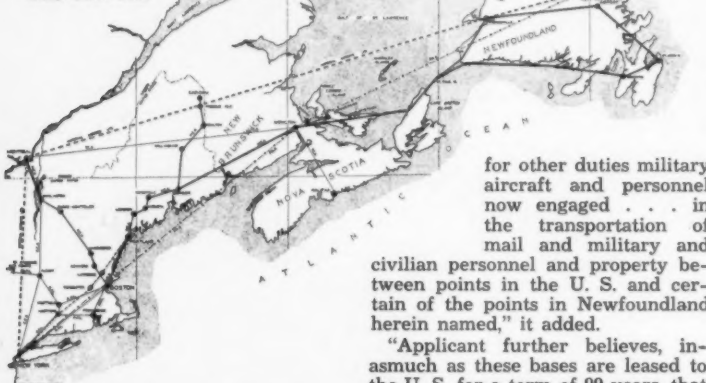
BELOW: THE "INSIDE STORY" OF A  
FLYING FORTRESS WING

## NEA Would Serve Military Bases

A ROUTE from Bangor, Me., to St. John's, Newfoundland, serving military bases being established by the U. S., has been proposed by Northeast Airlines.

Within Newfoundland, the route would operate in a circle, serving Stephenville, Newfoundland Airport, St. John's and Argentia, in that order, according to application filed with CAB.

The U. S. has



secured 99-year leases in Newfoundland, including areas in or adjacent to Stephenville, Argentia and St. John's at which points military bases are being established, the application said.

The route would "greatly aid the

national defense" by providing scheduled service between the bases and continental U. S. and "by relief which will be afforded the U. S. military services through releasing

for other duties military aircraft and personnel now engaged . . . in the transportation of mail and military and

civilian personnel and property between points in the U. S. and certain of the points in Newfoundland herein named," it added.

"Applicant further believes, inasmuch as these bases are leased to the U. S. for a term of 99 years, that they are essentially a territorial part of the U. S. and that as such, in accordance with sound public policy, they should be linked to the U. S. by an airline which is a citizen thereof and which operates aircraft of U. S. registry."

## It's not too late . . .

CHRISTMAS is nearly here. But there is still time to complement the aviation interests of your friends and business associates with a gift of American Aviation—Reports of What's New in Aviation—every 15 days of the New Year.

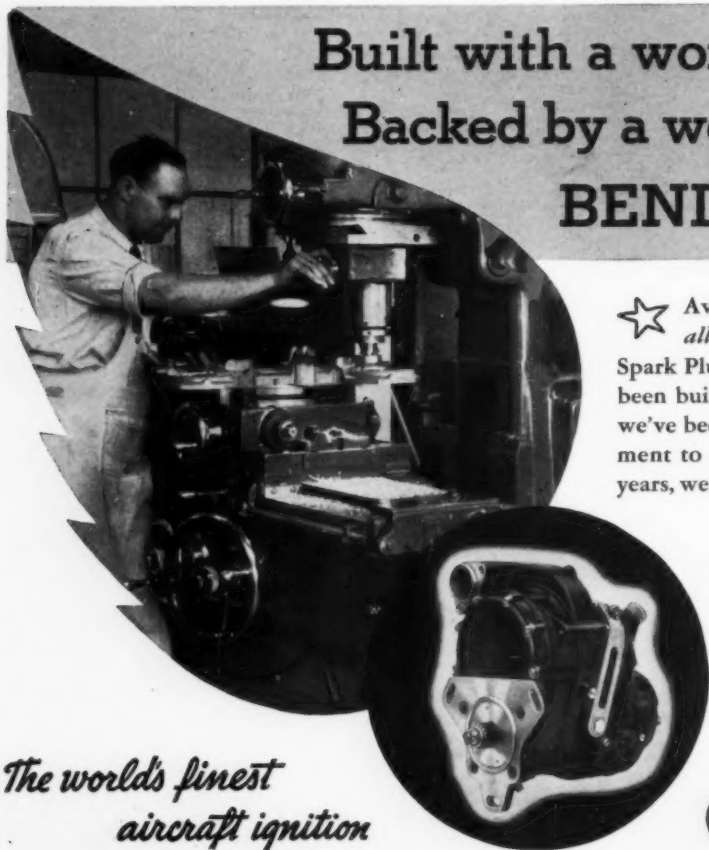


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Scintilla products are *built with a world of care and backed by a world of experience*. We believe that knowledge is a source of confidence for men who fly—especially these days, when American air supremacy means so much.

SCINTILLA MAGNETO DIVISION  
BENDIX AVIATION CORPORATION, SIDNEY, N. Y.

## BENDIX SCINTILLA

## Joins UAL



John W. Newey

Newly named assistant to the president of United Air Lines, in charge of stockholder relations. He will assume his position January 1. Newey is resigning as vice president and director of Stern, Wampler & Co., Chicago, and as a director of Chicago & Southern Air Lines.

## Air Cargo

(Continued from page 42)

ing details and services to and from and beyond the airports."

Universal Carloading and Distributing Co., main operating subsidiary of U. S. Freight, over the last 10 years has handled between 8½ and 3½ billion pounds of freight per year, UAF stated, adding: "It is applicant's opinion that at least a portion of this freight is transferable to the air cargo field."

UAF then expressed an opinion to which air cargo enthusiasts said "amen": "Through the development of air freight, applicant believes that the resultant costs of transportation of mail and passengers will be substantially reduced. This has been true in other transportation fields, and surveys indicate that the same will be true in air transportation."

"The air express and air freight fields have not been tapped to any great extent for reasons with which the . . . Board is familiar . . . Applicant believes that there is room in the air cargo field for it and that the existing air carriers will not be deprived of any part of their revenues but on the contrary that their revenues will be increased. The public will benefit immeasurably by the increased services which will be made available by the granting of this application."

Gill Robb Wilson, NAA head, New Jersey state aviation director and consultant for UAF, told a Washington & Jefferson College audience that "air cargo is feasible today. Anyone who thinks that a passenger will travel the skies

at 300 mph. and place no comparative value on the speeds at which his merchandise travels has not studied the history of transportation."

At present, he noted, only a few tons of cargo per year moves by air and this at a "prohibitive" rate of 86¢ per ton-mile.

### Cites Rail Express

"But we already have aircraft which can operate a distance of 1,500 miles at 200 mph. with a cargo load of more than eight tons at an overall cost of less than 7¢ per ton-mile. Contrast this with rail express which moves at approximately 15¢ a ton-mile at an average speed of 45 mph. and it is easy to see that a revolutionary advance in air commerce is at hand as soon as conditions permit equipment to be produced."

Capt. Wilson also predicted the use of "locomotive aircraft towing motorless cargo ships which will be turned loose over airports across the country. The parachute has certainly not reached the limits of its potential use for mail and package delivery from passing aircraft . . ."

### CAB Important

Whether there will ever be cargo operations similar to those of TACA, Central American pioneer, depends to a great extent on CAB, advocates agree. A certificate for Seaboard, they further agree, would give impetus to the movement. CAB, however, will have matters other than air freight to consider in its Seaboard decision, chief among which is the question of whether or not to put a new airline into competition with Eastern Air Lines.

CAB now has the power to adjust both express and passenger rates, as well as mail pay. If they ever exercise this power, conditions indicate that it will not be in the very near future, because of the postponed REA investigation.

Advocates hope CAB has not forgotten Sec. 1002(e) of the Civil Aeronautics Act, which instructs the Board in addition to insuring the carriers sufficient revenues, to consider "the need in the public interest of adequate and efficient transportation of persons and property by air carriers at the lowest cost consistent with the furnishing of such service."

## British Fear

(Continued from page 3)

ington at present is that Pan American Airways has been assured of a number of Constellations. Thus the British might substitute "Pan American" for "U. S." in Frye's statement on transport domination.

Should the U. S. Navy carry out its plan to "adopt" American Export Airlines, and send its flying boats on wartime missions to all corners of the world, Britain might well ponder the possibility of a second U. S. airline obtaining a head start in the post-war international air transport race.

# A RUN for Your Money

Thrift is a good old Yankee virtue but even more important today is the conservation of material for defense. When you install a set of Simmonds-Bentons you have the advantage of interchangeable three-part construction, saving up to two-thirds of the plug when replacement becomes necessary. Illustrated folder free. Simmonds Aerocessories, Inc., 10 Rockefeller Plaza, New York, N. Y.



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*Aircraft* POWER PLUGS

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Men who must make minutes count, count on TWA's unequalled schedules, city to city and coast to coast. By Stratoliner, New York is less than 14 hours away from Los Angeles, little more than 3½ hours away from Chicago. And TWA's air commuter service between the nation's industrial centers makes it possible to cover hundreds of long, land-measured miles, and get back in a single day.

Transcontinental & Western Air, Inc.  
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The TRANSCONTINENTAL Airlines





**HOSTESS SERVICE**

In keeping with its policy of providing the finest in air transportation, Continental now adds the comfort and convenience of hostess service. This service begins in December and will be available on every flight. Fly Continental—America's Fastest.

*America's Fastest*  
**CONTINENTAL AIR LINES**

### Action On Pick-up

(Continued from page 38)

turned to the Post Office by this operator in the month of March constitutes an all-time high in this respect for the length of time they have been operating and would compare favorably with the revenue received by the Post Office from many of the airlines which have been operating for years.

#### \$2 A Mile Now Paid

"We also recall that in the early days of developing air mail service that sums far in excess of 40c per mile were paid to insure its success. Two or three dollars a pound was not uncommon, and, as a matter of fact, the Post Office is paying today as high as two dollars a mile for the development of air transportation."

Hardin was emphatic in stating that "we completely disagree" with the contention that there is little chance of reducing the initial cost of pick-up through development of other revenues.

"To substantiate our position we merely cite the official records of the increase in air express for any period within the past five years which might be reviewed, notwithstanding the fact that we feel that the service is highly restricted and that the rates are entirely too high to attract the potential volume which awaits the establishment of an air express service adequate to



Amazing change in the administrative buildings at Baltimore is shown by the Eastern Air Lines pictures.



Small photo shows the "administrative" building at old Logan Field—shades of the old open-cockpit mailplane depot. Top photo is the terminal at the new Baltimore Municipal Airport which was finally dedicated Nov. 16.

meet the needs of the public at large.

#### Express Important

"In short, we feel that in a period of five years . . . air express will bear a substantial part of the burden of cost of pick-up and other forms of feeder airline operation."

Air mail subsidy, in his opinion, "is the difference between what the Post Office . . . pays the operator less the amount returned to the Post Office in postal revenues, and a fair and reasonable payment for service rendered in carrying the mail," Hardin explained.

"Using the All American case as an example, the record indicates that they are returning to the Post Office in form of postal revenues approximately 30c per mile (computed on the basis of originating mail only). Assuming that the CAB has established a rate of 40c per mile for this operator, there is a differential of approximately 10c per mile to be accounted for. From this 10c per mile must be deducted a fair and reasonable charge for the service rendered by the operator. Whatever remains is the actual subsidy.

"Surely this is not an exorbitant figure when expended for the purpose of developing a vast network of air transport lines which will serve many times the population now receiving direct air mail service, and will make available to these additional millions of American citizens express and light freight service as well.

"Furthermore, I am convinced that if a vigorous policy is pursued in the development of this type of service the necessity for subsidy can be greatly reduced within five years and eventually eliminated."

Hardin added ". . . we would like to point out that this is the only means to our knowledge by which first class mail can be transported by air. And we feel that such a development is inevitable for a number of reasons. We also feel that now is the time for both the government and private interests to pass on to the public the benefits of the great technical advances which are being made in the aeronautical field and to prepare for the wide-spread use of the vast number of men and materials which will otherwise become idle

and useless at the end of the present emergency unless preparation is made now to absorb both into the industry."

One question which it is believed the CAB analysis will attempt to answer is: how much air mail can a pick-up route be expected to originate? Same air mail, it is explained, would originate in towns even though they did not have pick-up service, and would be transported by train to the nearest airline stop. CAB is interested in determining how much more originates upon establishment of pick-up service.

In any event, action on the pick-up question seems assured for 1942.

### James Young Elected Head of Canadian ATA

JAMES YOUNG, president of the Canadian Pratt & Whitney Aircraft Co. Ltd., has been named president of the Air Transport Association of Canada, succeeding R. J. McGee, production manager of deHavilland Aircraft of Canada Ltd.

Other officers elected were G. L. Thompson, general manager of Canadian Airways Ltd.; vice president; R. B. C. Noorduy, vice president; Noorduy Aviation Ltd., secretary, and M. E. Ashton, general manager of Wings Ltd., treasurer.

C. R. Troup, vice president of Dominion Skyways Ltd., and G. MacDonal were elected to the directorate, which also includes L. Brintnell, president of MacKenzie Air Service Ltd.; W. Deisher, general manager of Fleet Aircraft Ltd., and W. F. English, assistant to the vice president of Trans-Canada Air Lines.

At the ATA meeting, held Nov. 17-18 in Toronto, the Trans-Canada (McKee) Trophy was presented to T. W. Siers, superintendent of maintenance for Canadian Airways Ltd., at present on loan to the Department of Munitions and Supply.

Siers was awarded the trophy for his contribution to the development of the Worth principle of oil distribution for aircraft engines, which has been applied with success to the starting of plane engines under Arctic conditions, without any pre-heating.



### IN DEFENSE OF TRADITION

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**Breeze**  
CORPORATIONS INC.  
NEWARK, NEW JERSEY

## Bird Problem

(Continued from page 40)

"live bird may be considered to be a liquid object in a fragile container."

4 Experiments conducted with a dead bird, "which had been bled, would lack the liquid content and not act in similar manner to a live bird."

One of the important conclusions derived from these tests is that the results based on work with solid missiles were more drastic than necessary, since actually a live bird on the wing is essentially a "liquid object in a fragile container." Conclusions from early studies were particularly discouraging because of the tremendous weights of glass apparently required to prevent large geese and swans from coming through into the cockpit. Some estimates ranged as high as three inches of laminated glass for normal size windshields installed in airplanes traveling at 200 mph.

A spectacular but most realistic approach to the aircraft windshield problem is that now planned by the technical development division of the CAA. Aiming to simulate closely as possible the impact registered upon an airplane windshield by large birds in flight, the CAA shortly will begin shooting freshly killed geese out of a compressed air gun. The new series of experiments, which are hoped to determine the most efficient combinations of glass and plastic for windshields, will get underway at the Bureau of Standards—where the chicken shooting tests were held—soon as a larger gun is obtained.

CAA specifications for the new gun provide for a velocity of 400 feet a second (about 270 mph.) with a 16 pound bird, allowing a four pound margin over the largest wild bird normally encountered during migrations. The CAA research will be coordinated with work of the Pittsburgh Plate Glass Co. which during the past summer submitted various glass samples to the airlines for testing.

Other methods being given some official consideration in the battle against birds include that of dropping a metal grating over the wind-

shield of the plane in flight; the installation of two panes of glass separated by a layer of air, and the use of smaller panes in the windshield with more strength per unit.

Under the metal grating scheme, the planes would fly on instruments all the way. While blocking of the pilot's frontal vision with an opaque screen at first impression sounds fantastic, CAA technical experts have declared the notion "not at all impossible and not far fetched."

No less than three important benefits are claimed for the metal grating device, to overcome the disadvantage of added weight. Dropping of a metal grating over the windshield, it is claimed, would (1) protect the pilots against birds, (2) protect the pilot from the possibility of lightning shock, and (3) under icing conditions, collect the ice so that when the grating is retracted for landing, the pilot would have a clear windshield.

While the search goes on for the perfect windshield glass, a vastly improved plastic material is already available for installation in transport planes this winter, according to information received from Beard.

Commenting on a glass combination submitted for testing by the Pittsburgh Plate Glass Co. last summer, Beard indicated that "such glass may not give 100% protection against the largest birds, but it will protect against 95% or more of the birds that have come through the windshields. . . . The various samples have proved that a large increase in impact strength can be secured without changing the existing frame and with only three pounds increased weight."

The new material is a combination of semi-tempered glass with Vinal plastic filler. Light transmission qualities are claimed equal to the duplate or triplex glass now used, with refraction qualities equally as good even at fairly sharp angles. This glass combination selected from the various samples as having the most strength for the least weight is expected to be adopted for standard installation in all American Airlines planes.

Other airlines are also expected to swing over to the new glass combination windshields this winter, with material available from Pittsburgh Plate Glass Co. and Libby-Owens-Ford Glass Co.



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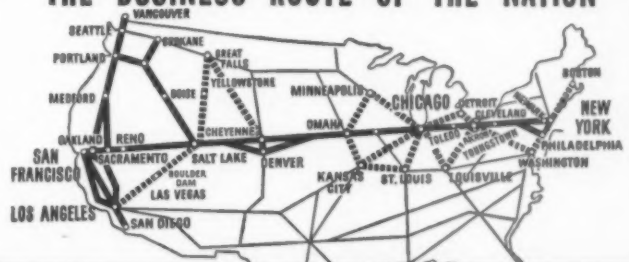
Because United goes where business is—business flies United.

## UNITED AIR LINES



Year round, the Main Line Airway for passengers, mail and express.

## THE BUSINESS ROUTE OF THE NATION



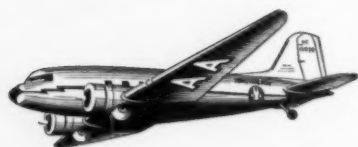
Mid-Continent offers the only direct air service between St. Louis and Minneapolis. And between St. Louis and Des Moines there are now two round-trip flights daily. To or through Mid-America, fly Mid-Continent—Save Time by Air.

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## AIR CARRIER RECORD

C.A.B. APPLICATIONS, HEARINGS, DOCKETS

### APPLICATIONS

Northeast Airlines has filed application for a route from Bangor to Newfound land. Complete story on page 44.

Mid-Continent Airlines is seeking routes for the carriage of air mail via the pick-up method. Story on page 38.

Northwest Airlines has filed for a Chicago-Washington route. Century Aviation Co., Wayne, Neb., has filed application for certain pick-up routes. Story begins on page 38.

Delta Air Corp. seeks amendment to its Atlanta-Cincinnati route to extend service from Cincinnati to Roanoke via Charleston, and from Roanoke to Norfolk via Lynchburg and Richmond, and to (2) Columbia, S. C., via Winston-Salem and Charlotte.

Pennsylvania-Central Airlines seeks a route from Norfolk to Detroit via Richmond, Roanoke, Charleston, Columbus and Toledo. It also asks extension of AM55, Norfolk-Knoxville, from Chattanooga to Memphis.

### EXAMINERS' REPORTS

**EAL Non-stop:** Examiner Herbert K. Bryan has recommended that Eastern Airlines be permitted to operate non-stop between Chicago and Atlanta.

**NWA Disfavored:** Northwest Airlines' application for a route from Chicago to Twin Cities via Milwaukee, Green Bay, Wausau and Eau Claire should be denied according to a report issued by CAB Examiner John Belt.

### CAB DECISIONS

**C&S Rate:** CAB has issued a rate decision increasing air mail pay of Chicago & Southern Air Lines.

**PAA Gets Stop:** Pan American Airways has been exempted from the provisions of the Civil Aeronautics Act to enable the company to serve Galena, Alaska, on its Nome-Fairbanks route.

**Mirow Purchase:** CAB has approved purchase by Wien Alaska Airlines of Mirow Air Service. Agreeing with its examiner, the Board said it felt that a discriminatory monopoly would result from the acquisition, since there is sufficient competition from other existing airlines in the areas served.

### HEARINGS AND ORAL ARGUMENTS

**Atlantic Case:** Hearing continued during the past two weeks on application of Pennsylvania Central Airlines, Seaboard, National, Eastern and Canadian Colonial for routes on the eastern coast.

**Texas Argument:** CAB heard oral argument Nov. 13 on applications of Continental, Essair, Braniff and TWA for routes in Texas. CAB Examiner T. J. Wrenn had recommended that CAL receive a San Antonio-Hobbs route, the Braniff be awarded San Antonio-Laredo and stops at Austin and Lubbock.

### MISCELLANEOUS

**Palmedo Okayed:** Interlocking directorate involving Roland Palmedo as director of American Export Airlines and director of Air Associates, has been approved by CAB.

### CALENDAR OF HEARINGS

Dec. 8—American Airlines, route from El Paso and/or Ft. Worth to Mexico City.  
Jan. 12—TWA, Chicago & Southern, Eastern, for Indianapolis-Detroit, St. Louis-Detroit and Memphis-Detroit.

### PAA To Ireland

With lifting of restrictions of the Neutrality Act, Pan American Airways has announced that it will resume service to Foynes, Ireland, over the north Atlantic route, "in the early spring." During the winter, crossings will be made via Bermuda and the Azores to Lisbon. PAA will probably start the northern route, suspended since September, 1939, with Clippers substituting four-engined Lockheed Constellation landplanes as they become available.

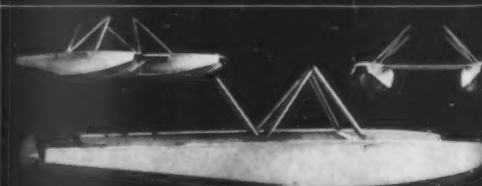
## EDO FLOAT GEAR

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MILITARY—SINGLE FLOAT GEAR



COMMERCIAL—TWIN FLOAT GEAR



## FDR Requests More Money for CAA

## Funds Asked for 104 Airport Projects

IF, AS EXPECTED, Congress approves President Roosevelt's recent request for a supplemental appropriation for the Commerce Dept., funds will be released to bring 104 new airport projects under the Civil Aeronautics Administration's airport development program. The new projects will increase to 503 the total number of fields to be improved or developed for national defense since beginning of the CAA airport program last year.

Of the \$58,160,725 sought for the Commerce Dept., \$57,865,300 is earmarked for development of landing areas by the CAA, \$86,280 for maintenance and operation of Washington National Airport, and \$209,145 for the Weather Bureau's observation and warning service. At this writing, the deficiency subcommittee of the House Appropriations Committee has completed hearings

## Civil Aeronautics Authority\*

## Appropriations for Fiscal Years 1939-1942

	1939	1940	1941	1942	Total
General Administration .....	\$ 1,352,286	\$ 1,264,306	\$ 1,078,200	\$ 990,000	\$ 4,684,792
Maintenance of Air Navigation Facilities .....	7,336,508	9,510,487	11,896,550	15,500,000 <sup>a</sup>	44,243,545
Establishment of Air Navigation Facilities .....	4,575,000	7,000,000	7,356,280	12,036,000 <sup>b</sup>	30,967,280
Development of Landing Areas for National Defense .....			40,000,000	100,477,750 <sup>c</sup>	140,477,750
Technical Development .....	404,007	557,000	557,000	520,000	2,038,007
Enforcement of Safety Regulations .....	1,301,598	1,990,308	2,484,453	2,740,000	8,516,359
Civilian Pilot Training Program .....		4,000,000	36,814,504	25,000,000	65,814,504
Washington National Airport, Maintenance and Operation .....			255,650	290,000	545,650
Washington National Airport, Construction of Hangars .....			2,700,000		2,700,000
Emergency Relief, Commerce, Administrative Expenses .....	325,000	250,000	175,000		750,000
Printing and Binding .....		72,900	72,900		145,800
Purchase and Maintenance of Aircraft .....	335,000				335,000
<b>Total Civil Aeronautics Administration .....</b>	<b>\$15,629,399</b>	<b>\$24,645,001</b>	<b>\$103,390,537</b>	<b>\$157,553,750</b>	<b>\$301,218,687</b>

\* These figures do not include appropriations for the Civil Aeronautics Board which totaled \$1,122,999 in fiscal 1940; \$1,345,397 in fiscal 1941; and \$1,179,000 in fiscal 1942.

<sup>a</sup> Includes \$1,100,000 supplemental appropriation.

<sup>b</sup> Includes \$5,586,000 supplemental appropriation.

<sup>c</sup> Includes \$5,500,000 supplemental appropriation.

on the measure, and is expected to report the bill to the House floor shortly.

While Congress may change slightly the total amount requested,

no sizeable slicing of the \$57,865,300 airport item is anticipated, since it is in the national defense category and the need for the development of additional landing areas throughout the country at this time is generally recognized.

The deficiency appropriation would increase to \$158,343,050 the total amount allotted the CAA during the current fiscal year for airport development in the U. S. and Alaska.

According to information from the CAA last week, allocations have already been made on all but 14 of the 149 new projects to be developed under the \$95,000,000 fund originally appropriated for the CAA's fiscal 1942 U. S. airport program.

In keeping with the policy established last year, the 104 fields to be brought into the CAA program, if the deficiency funds are released, have been selected by a joint CAA-Army-Navy committee on the basis of military and civil airport needs. The list of fields, however, is not expected to be made public until several weeks after the money is made available by Congress.

Questioned by AMERICAN AVIATION, the War Dept. refused to discuss the new supplemental program and declined to comment on whether military aviation might require still further expansion of the CAA's airport program during this fiscal year; but the CAA has suggested that aside from the 503 projects mentioned, there are still "quite a few" fields around the country that should be developed from a "civil standpoint." It is conceded though that the entire scope of the airport program at this time will be determined by national defense needs.

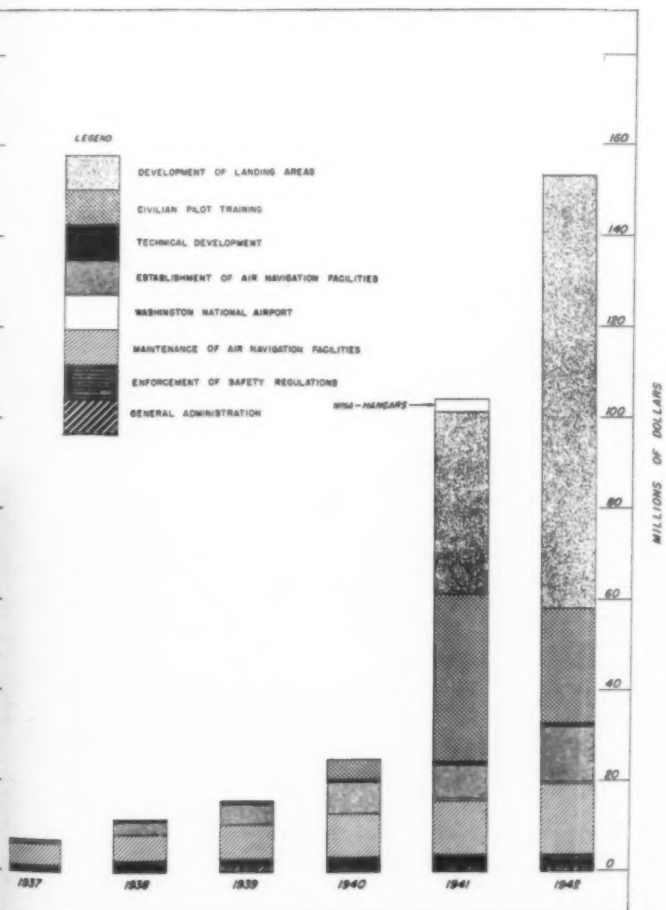
As shown in the accompanying table, Congress has thus far appropriated \$140,477,750 for the development of landing fields by the CAA in fiscal 1941 and fiscal 1942, the sum representing 46% of the \$301,218,687 total allotted for the administration of civil aviation from fiscal 1939 to date.

Next largest budget item since

the creation of the CAA has been the Civilian Pilot Training Program which has absorbed 21% of the total CAA appropriations. The establishment and the maintenance of air navigation facilities together account for nearly 25% of the CAA total, with \$4,684,792 or 1.5% going for general administrative expenses.

## Federal Appropriations for Civil Aviation

## Fiscal Years 1937-1942



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# Price of Listed Shares Declines In Spite of Record Dollar Income

By F. H. STEVENSON

WITH dollar income of the aviation industry certain to reach record totals in 1941, it is startling to discover that during October the average price of aircraft shares listed on the New York Stock Exchange declined from \$19.27 to \$17.83 per share, a drop of \$1.44. It is even more startling in that the average price of all listed shares was off only \$1.36 per share, for certainly the aviation picture would seem at first glance to be brighter for 1942 than that of many other businesses.

The industry was called upon to raise its production to unprecedented figures and later to double, triple and even quadruple it. Lack-log totals read like national debt figures for some countries and appropriations sound more like calculations of light-years to the nearest stars than actual dollar totals.

In the midst of this lavish spending on aircraft and aircraft acces-

sories and plant expansion, what about the outlook for profits for the companies involved and for the industry as a whole? No official estimates are available on this subject and only a few hardy souls ever venture a guess as to actual totals.

Aviation manufacturing companies as a whole have made money in recent years. In 1939, 31 corporations engaged primarily in the manufacture of aircraft and aircraft equipment had net sales of about \$278,763,000 and in the following year of \$592,410,000. On these sales, net profit after all charges was \$33,866,000 and \$71,045,000, respectively.

## Direct Connection

Stripping these figures to their bare essentials, there appears to be a direct connection between profits and sales as the latter advanced concurrently with the former to double between 1939 and 1940. The inference could be drawn that, with these firms, profits have gone up in direct ratio to increases in sales—and sales, as measured in deliveries, have been mounting rapidly since 1940. As a practical matter, of course, this ratio can't possibly hold true beyond a certain point.

Clearly, sales received consider-

## McDonnell Gives Raises

### To Over 400 Employees

McDonnell Aircraft Corp., Robertson, Mo., last month granted raises of 3c to 12c an hour over 400 production and maintenance employees following negotiations with the International Association of Mechanicals (AFL).

Beginner and apprentice rates were raised to 56c with an automatic increase to 71c after three months, against former beginners' starting rate of 53c with a raise to 59c after three months.

able impetus in the two-year period. Totals as to foreign buying are not readily available, but in 1939 U. S. Air Corps appropriations were \$73,556,972 and those for Navy Bureau of Aeronautics \$48,075,000 or a combined total of \$121,631,972. In 1940 the Air Corps total was \$243,631,388 and the Navy \$111,459,000 or \$355,090,388 for the two.

Although these figures are not all inclusive totals for these two years, nor do they represent actual expenditures, they do show a tripling of Army and Navy aircraft and accessory appropriations during the same period that company sales and profits doubled or a three to two ratio. It should be noted also that government appropriations are for fiscal years.

Projecting these figures into the future, Air Corps appropriations for 1941 were \$3,892,769,590 and Navy \$452,319,950 or a combined total of \$4,345,089,540. Thus, 1941 appropriations were 12 times those of 1940. If the three to two ratio held true total company net earnings would increase eight times over 1940. And, thus far in 1942 fiscal year, Air Corps appropriations total \$3,448,842,520 and Navy \$1,006,596,600, or combined, \$4,455,439,120. This would seem to indicate earnings in 1942 similar to those in 1941.

## Other Factors

However, this is the mere working out of mathematical ratios. Taking into account such factors as increased labor costs, mounting taxes, greater overhead due to increased depreciation, maintenance, and the like, necessary to turn out the greater volume of planes, and increased facilities, it seems hardly likely that these ratios could carry through anywhere near intact. Also, it seems incredible that totals when actually reported will be as high as the above figures indicate.

Through sheer volume of business, however, and such factors as increasing standardization of models, parts, equipment, etc., making for more economical production, it seems likely that there will be a large dollar rise in earnings totals of the industry, even though profits may be small, or show a decline, percentage-wise to sales.

Even this may have its bright side as it seems almost certain that a large percentage rise in profits as

related to sales would only increase the outcry on Capitol Hill for profit limitation legislation and other restrictive measures.

(NOTE: Some of the figures above were taken from an SEC compilation of earnings of 31 aircraft companies, just released; sent below is a summary of the data as prepared by the Commission.)

COMBINED TOTALS (Dollars in Millions)	
	1940
Net Sales	\$392
Net Profit from Operations	140
Net Profit after All Charges	71
Total Dividends	33
Total Assets	880
Capital Stock	66
Surplus	164
Net Profit from Operations in Percent of Sales	33.7%
Net Profit after All Charges in Percent of Sales	12.0%
Ratio of Current Assets to Current Liabilities	1.14%

In the table above, the failure to carry profits from operations down to net in 1940 may be at least partially accounted for by a rise in income tax payments from \$10,112,000 in 1939 to \$70,941,000 in 1940.

## 31 Companies

The 31 companies studied by the SEC are: Air Associates, Inc.; Aircraft Accessories Corp.; Aviation Corp.; Beech Aircraft Corp.; Bell Aircraft Corp.; Bellanca Aircraft Corp.; Boeing Airplane Co.; Breeze Corporations, Inc.; Brewster Aeronautical Corp.; Consolidated Aircraft Corp.; Curtiss-Wright Corp.; Douglas Aircraft Company, Inc.; Fairchild Aviation Corp.; Fairchild Engine and Airplane Corp.; Grumman Aircraft Engineering Corp.; Irving Air Chute Co., Inc.; Lockheed Aircraft Corp.; Glenn L. Martin Co.; Menasco Manufacturing Co.; North American Aviation, Inc.; Republic Aviation Corp.; Ryan Aeronautical Co.; Solar Aircraft Co.; Sperry Corp.; United Aircraft Corp.; United Aircraft Products, Inc.; Vega Airplane Co.; Vultee Aircraft, Inc.; Waco Aircraft Co.; Warner Aircraft Corp.; Wright Aeronautical Corp.

## Trading Summary

Trading on the New York Stock Exchange proceeded at about the same pace as in the preceding two weeks—344,070 shares against 320,240 (included one additional trading day in latest period). Prices were mostly a little lower, 15 issues showing declines, eight plus signs and two unchanged. American Airlines proved an exception to the general trend, gaining 3½ points on a 3,900-share turnover. Other active issues included: Aviation Corp. off ¼, 38.200 shares; Consolidated Aircraft, off ¼, 38.000; Curtiss-Wright, off ¼, 34.600; Pan American, up 1½, 25.500 shares; and United Aircraft, up 2½, 18.100. Douglas Aircraft dropped seven points on 10,400-share trading. Sperry Corp. lost 2½ on 9,700 shares.

New York Stock Exchange reports that during September Consolidated Aircraft Corp. acquired 4,600 shares of its common stock to bring its holdings to 9,200 at the end of the month.

Trading on the Curb was at about the same pace—78,800 shares against 74,600. Prices also were mostly lower, 13 issues showing declines, five plus signs and two unchanged. Vultee Aircraft was the most active, gaining ½ on 11,500 shares. Other active issues included: Bell Aircraft, off 1½ on 4,800 shares; Breeze Corps., off 1, 4,400; Brewster Aero, off ¾, 7,200; Cessna Aircraft, up 1½, 8,600; Fairchild Engine & Aircraft, off ¾, 9,800; Penn-Central, off 1½, 5,000; and Republic Aviation, off ¼, 8,000.

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## Latest Earnings Reports

### Airline Seeks Public Financing

## PCA Offers Preferred Stock to Pay Bank Debts and Get More Capital

FIRST airline preparing to enter the public markets for new financing in several months, Pennsylvania-Central Airlines Corp. on Nov. 17 filed a registration statement with the Securities & Exchange Commission covering 75,000 shares of \$1.25 cumulative, convertible preferred stock, without par value, but with a stated value of \$25 per share.

The preliminary prospectus lists the offering as taking place in November, although exact date is not given, indicating that the company is eager to market its securities as soon as possible, as such a date does not allow for elapse of the 20-day waiting period before offering. (The SEC may shorten this waiting period at its discretion).

The proposed offering price of the preferred is \$25 a share. Covered by the same statement are 150,000 shares of \$1-par common stock, which will not be offered publicly, but are reserved for the conversion of the preferred shares.

The proceeds of the public offering will be used as follows: \$1,429,570 to pay off bank loans and interest thereon and \$247,946 will be added to working capital.

That the securities will have considerable public interest is indicated by the list of well-known and large investment banking firms which are

pared with \$7,902,270 year ago; expenses \$8,724,495 against \$6,720,049.

Since Sept. 30, 1940, 14 new Douglas DC-3s and two new Douglas sleepers

underwriting the issue and the amount of their participations in it: White, Weld & Co., 17,300 shares; Carl M. Loeb, Rhoades & Co., 17,300; Cohu & Torrey, 8,000; Auchincloss, Parker & Redpath, 7,000; O'Brian, Mitchell & Co., 7,000; Kay, Richards & Co., 6,500; Stern, Wampler & Co. Inc., 4,300; Stroud & Co. Inc., 4,000; and Mackubin, Legg & Co., 3,600.

The statement lists 331,790 shares of capital stock outstanding as of Sept. 30. The salary of C. Bedell Monro, president, for the past fiscal year is given as \$12,500 and is estimated for the current fiscal year at \$18,000.

On Nov. 15 PCA had warrants outstanding covering 9,908 shares of capital stock which may be exercised at \$14.05 per share prior to Mar. 20, 1942.

On Apr. 17, 1940, options were issued to officers and certain employees to purchase 8,627 shares of capital stock at \$10.50 per share to Apr. 17, 1943; provided that each person may not buy more than two-thirds of the stock covered by the options before Apr. 17, 1942.

Of the total, options covering 4,627 shares were issued to Monro and 900 shares to Frederick R. Crawford, executive vice president and secretary. As at Nov. 15 none of the options had been exercised, according to the statement.

have been placed in operation. "It is expected that 16 airplanes will be allocated to your company by the Priorities Board for delivery in 1942-43.

### Transcontinental & Western Air

Transcontinental & Western Air Inc. reports an increase in passenger revenue of \$1,865,844 in the first three quarters of this year over the 1940 period, with air express and freight revenue up about 60%. Mail revenue, despite an increase in poundage of 1,111,993, showed a decline of \$187,621 because of a revised basis of air mail payments made effective by the Civil Aeronautics Board.

A net profit of \$599,628 for the third quarter reduced to \$156,538 the corporation's net loss for the nine-month period. Revenue passenger miles flown advanced from 114,626,186 for the first nine months of 1940 to 151,341,601 this year.

The financial statement showed that on Sept. 30 net working capital was \$2,119,708 and working capital ratio of 2.2 to 1. Bank loans were reduced to \$750,000 from \$1,250,000 at the beginning of the quarter. Revenues for nine months to Sept. 30 totaled \$10,999,220 against \$8,574,926 in 1940 and expenses were \$10,606,181 against \$8,775,372.

### Reliance Mfg. Co.

Maker of parachutes, etc. reports for September quarter a net profit of \$242,311, equal, after preferred dividend requirements, to \$1.01 each on 222,855 common shares, against \$66,523, or 21c common share in 1940 period. Nine months net profit after taxes was \$472,344, or \$1.88 a common share, against \$186,370, or 57c, last year.

### United Aircraft Corp.

Reports for three months to Sept. 30 net profit after all charges of \$5,383,822, equal to \$1.95 on each of 2,766,891 capital shares, against \$2,971,662, or \$1.12, in 1940 period. Sales and operating revenues were \$81,604,988 new business booked, \$37,112,644 against \$39,805,913 in 1940 period. Backlog on Sept. 30, 1941, was \$499,048,847, against \$493,516,120 on July 1, 1941.

Nine months net profit after taxes was \$10,771,732, or \$4.05 a share, against \$10,461,127, or \$3.93, in 1940. Sales and operating revenues were \$203,435,155 against \$179,023,797 for first nine months of 1940.

### Aerco Corp.

Reports for three months to Sept. 30 net profit after tax provisions of \$25,962, or about 14c on each of 180,000 capital shares outstanding. October shipments by the company, which has a \$1,000,000 backlog, exceeded those in September by 27%.

### Fairchild Aviation Corp.

Reports a net profit, after charges and federal income and excess profits taxes, of \$666,783 for nine months ended Sept. 30, or \$1.98 each on 337,032 shares. This compares with \$422,031, or \$1.26, in 1940 period. Profit before taxes were deducted amounted to \$1,666,959 compared with \$703,386 in first nine months of 1940. Unfilled orders on Sept. 30 totaled \$23,422,740 compared with \$23,614,442 on June 30 and \$5,240,346 on Sept. 30, 1940.

### Aircraft Mechanics Inc.

Company reports earnings in the first half of 1941, before taxes, were \$90,000.

500. June 30 statement: cash \$6,400; receivables \$102,900; merchandise \$125,300; trading assets \$234,600; current debts \$103,500; working capital \$131,100; mortgage \$3,200; tangible net worth \$272,500. Firm says it is now almost entirely engaged in manufacturing stressed air frame parts principally for Douglas, Boeing and Murray Corp. of America.

### Howard Aircraft Corp.

Reports loss of \$3,080 for nine months to Aug. 31 against loss of \$91,892 in 1940 period. Balance sheet for Aug. 31 shows: Assets \$570,132; current assets \$376,379 (cash \$6,940); accounts receivable \$35,237; merchandise and raw material \$107,869; merchandise in process \$188,130; fixed assets \$193,753. Current liabilities \$252,579. Net sales for nine months were \$433,089 against \$347,289 year ago; gross profit \$49,390; total expenses \$46,741 against \$74,829 year ago.

### Curtiss-Wright Corp.

Reports for three months to Sept. 30 a consolidated net profit of \$5,792,733 after charges, equal, after dividend on \$2 non-cumulative Class A stock, to 70c each on 7,432,027 \$1-par common shares, compared with \$2,069,670, or 20c, year ago and \$5,784,318, or 70c, in quarter ended June 30, 1941. Nine months net profit was \$16,457,071, or \$1.98, against \$8,305,639, or 88c, year ago.

### Wright Aeronautical Corp.

Reports for three months to Sept. 30 a net profit after charges of \$2,795,947, or \$4.66 each on 599,857 capital shares, against \$1,206,963, or \$2.01, year ago and \$2,992,338, or \$4.99, in quarter ended June 30, 1941. In nine months net profit was \$8,137,548, or \$13.56, against \$3,806,952, or \$6.34 in 1940 period.

### Rohr Aircraft Corp.

Reports for fiscal year to July 31 a net profit after all charges of \$288,884, or about \$1.93 each on 150,000 capital shares outstanding; sales were \$1,493,488; backlog Sept. 30, "over \$10,000,000." The company says that personnel, which was 978 on Oct. 1, must be increased to 3,000 by Mar. 31, 1942, "in order to produce the quantity of goods scheduled for delivery under current contracts."

### United Air Lines

Company reports third quarter net earnings of \$1,242,588 after charges, or equivalent to 82.8c a share compared with \$627,721, or 41.8c, year ago. Passenger revenue miles were 96,250,169, up 24.6%; mail pound miles 1,912,161,436, up 29.9%; express pound miles 851,246,449, up 40.7%; revenue plane miles 7,633,190, up 12.1%. Net loss for first half was \$562,316, and company showed a net profit of \$680,272 in first nine months.

### Eastern Air Lines

Firm reports nine months net profit of \$883,168, or \$1.54 a share, against \$792,221, or \$1.41, in like 1940 period. Third quarter profit was \$114,505, or 20c each on 572,658 common shares, against \$58,295, or 10c on 562,038 shares year ago.

Revenues for third quarter were \$3,466,159 against \$2,486,654 year ago; expenses \$3,006,653 against \$2,317,359. Revenues for nine months of \$10,348,644 com-

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### Vega Airplane Co.

Despite the secrecy with which such matters have been surrounded by various government agencies, Vega Airplane Co. recently filed a report with the Securities & Exchange Commission listing two contracts with the British Government, giving not only plane totals, costs, etc., but delivery schedules and other "hush, hush" information as well.

The contracts, between Lockheed Aircraft Corp. and the British government, were entered into on June 6 and Nov. 6, 1940, and call, respectively for 300 and 375 Lockheed Model 37 aircraft (Vega Ventura Bombers). Both contracts were subsequently sublet to Vega and call for payment to Lockheed by Vega of \$2,000 per plane manufactured thereunder.

The first contract lists unit base price as \$31,664 and aggregate base price as \$24,499,440 for airplanes (less starters, generators and control boxes) without engines, propellers and propeller accessories, Burbank, Cal.

Completion schedule on this contract was set as follows: (1941) Feb., one; Apr., two; May, 10; June, 30; July, 44; Aug., 63; Sept., 75; and Oct., 75. Spare parts are to be completed substantially with planes.

The contractor is to supply 300 planes and Britain is to supply 600 Pratt & Whitney R2800 S1A4G engines and 600 Hamilton Standard Hydromatic propellers; the contractor is also to supply airframe parts up to 20% of price of airplanes (less engines and propellers), drawings, manuals, blueprints and parts list.

The government may terminate, wholly or in part, at any time upon notice and on deposit of 35% of unpaid contract price in escrow, although Britain would then pay cost of materials, labor and overhead allocable to items not delivered, plus 12% of adjusted contract price thereof.

Under the second contract for 375 planes the unit base price (on same basis as the preceding contract, but also excluding constant speed governors) was \$91,200 and aggregate base price \$34,200,000. Britain is to furnish 750 Pratt & Whitney R2800 S1A4G engines and 750 Hamilton Standard Hydromatic propellers. Completion schedule: (1941) Dec., 75; (1942) Jan., 100; Feb., 100; and Mar., 100. Other contract terms appear substantially the same as the first contract, with the exception that escrow deposit on cancellation of contract is 25%.

### Lockheed Aircraft Corp.

Firm lists as of Sept. 10 Continental Illinois National Bank & Trust Co. as added to the 12 banks with which the company has a loan agreement dated Apr. 21, 1941. This also amended borrowing limit raising it from \$15,000,000 to \$22,500,000. The firm reports a \$5,000,000 increase in borrowings to \$15,000,000 as of Sept. 25, the increase divided as follows: Bankers Trust Co., \$750,000; Central Hanover Bank & Trust Co., \$1,000,000; Chase National Bank, \$1,000,000; J. P. Morgan & Co. Inc., \$1,000,000; National City Bank of N. Y., \$1,000,000; and California Bank, \$250,000.

### Bellanca Aircraft Corp.

Company reports entering into a loan agreement dated Aug. 13 with Equitable Trust Co. for a bank credit of \$600,000 secured by a first mortgage of \$400,000 on its New Castle, Del., plant and by assignment of all payments under contracts between Bellanca and Glenn L. Martin Co. pertaining to manufacture of parts. The loans are evidenced by 6% demand notes.

The total of the notes at present is \$510,000 and they are to be paid off as follows in 1942: July \$50,000; Aug.

\$50,000; Sept. \$75,000; Oct. \$100,000; Nov. \$125,000; and Dec. \$200,000. Of the present sum outstanding, \$400,000 was used to repay indebtedness to Equitable Trust Co.; \$19,000 for building purposes; \$10,000 for purchase of machinery; \$42,000 for payment of machinery on order or received during October.

Company reports that on Oct. 23 directors adopted a plan for payment of a bonus to certain key employees for the last quarter of 1941 and the calendar year of 1942. Firm will set aside 10% of profits from operations before federal income taxes, and bonuses will be paid in proportion to salaries on Jan. 1, 1942, but are not to exceed 40% of such salaries for the period to which the bonus is applicable. Five per cent in excess of the amount required above, but not exceeding \$200,000, will then be set aside and distributed to employees as a reward for merit.

### Aviation Corp.

Firm reports dissolution on Oct. 20 of Toronto Aerodrome Ltd., a wholly owned subsidiary of the company.

### Glenn L. Martin Co.

Company reports an increase as of Oct. 21 of \$4,000,000 to \$20,000,000 in its 1½% promissory notes issued to Guaranty Trust Co. of N. Y. under an EPF contract. The notes mature Oct. 1, 1942.

### Vultee Aircraft Inc.

On Sept. 26 granted options to purchase 5,250 shares of \$1-par capital stock at \$10 per share as follows: Hugh Fenwick 1,000 shares; C. W. Perelle 1,500; W. H. Burdick 1,000; T. C. Sullivan 1,000; and C. T. Bovee 750. The options may be exercised on or before Dec. 31, 1942, provided each optionee may purchase not exceeding two-thirds of his stock in 1941 and the balance in 1942. Fenwick held options on 1,750 shares as of Sept. 26, company states. On Sept. 26, company had 30,750 shares under option.

Company states that on Oct. 10 it entered into a loan agreement with Chase National Bank of N. Y. to borrow \$6,000,000 under a 3% promissory note due March 31, 1943. The proceeds are to be used to pay "current liabilities incurred in acquiring current assets or prepaying insurance, taxes or other deferred charges applicable to current assets. It is impossible for the registrant further to determine the exact use of the proceeds of such loan."

### Republic Aviation Corp.

Firm reports an increase as of Oct. 31 of \$451,578 to \$5,208,370 in its 2½% promissory notes to First National Bank of Boston, Chase National Bank of N. Y., Guaranty Trust Co. of N. Y. and Bank of Manhattan Co. The notes, due Jan. 1, 1942, were issued under an EPF contract for acquisition, construction and installation of additional plant facilities adjacent to the company's present factory at Farmingdale, L. I., N. Y., and are not to exceed \$6,336,497. Proceeds of the latest loan were used as follows: \$6,793 land and land improvements; \$381,192 buildings; \$70,955 machinery, tools and equipment; and \$10,699 interest; leaving a \$18,063 decrease in its working cash balance.

### United Aircraft Corp.

Company lists borrowings during October on 2½% promissory notes issued under five EPF contracts from National City Bank of N. Y., acting on behalf of itself and other participating banks, as follows: (1) due July 1, 1947, up \$2,823,993 to \$12,310,693; (2) due July 1, 1947, up \$54,248 to \$1,451,465; (3) due July 1, 1947, up \$115,135 to \$1,934,457; (4) due July 1, 1948, up \$762,923 to \$1,182,947; and (5) due July 1, 1947, up \$129,793 to \$191,031.

### Fairchild Engine & Airplane Co.

Company reports borrowing from Bankers Trust Co. during October under three loan agreements entered into pursuant to EPF contracts as follows: (1) up \$63,000 to \$983,000, not to exceed \$1,200,000; (2) up \$93,000 to \$1,163,000, not to exceed \$2,200,000; and (3) up \$16,000 to \$376,000, not to exceed \$600,000.

### Consolidated Aircraft Corp.

Firm states that in September employees (other than R. H. Fleet, president) exercised options and purchased 935 shares of \$1-par common at \$19 per share. The proceeds, \$18,700, were added to working capital.

On Oct. 17, the company paid a 1941 stock dividend amounting to 648,750 common shares (including a dividend of 4,600 shares held in treasury) to stockholders of record Oct. 1. Capital surplus account was credited with \$17,765, being \$19 per share on 935 common shares sold to employees. Earned surplus was charged and capital stock account was credited with \$646,722, being \$1 per share of common issued as a stock dividend. As of Oct. 31, the company had no options outstanding on any of its shares.

### Chicago & Southern Air Lines Inc.

Firm reports a decrease as of Nov. 30 of \$21,875 in its bearer notes leaving \$218,750 outstanding as of that date. The notes were issued under a trust indenture between the company and American National Bank & Trust Co. of Chicago and Benjamin G. Kilpatrick, as trustees. They were issued April 25, 1940, and totaled \$350,000. The proceeds were used for payment of interest, \$3,655; purchase of three Douglas DC-3s, \$331,161; and purchase of engines, spare parts, etc., \$15,183.

### Bendix Aviation Corp.

Company reports exercise of options covering 1,750 shares of its \$5-par common stock. Company also states that on Oct. 7, David O. Thomas, vice-president, exercised options covering 1,000 shares at \$30 per share. (The buyer of the other 750 shares was not given). On Oct. 31, Thomas held options on an additional 1,000 shares and on the same date options previously granted by company covered 15,350 shares.

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